

# National Testing Agency

**Question Paper Name:** COMPUTER AND SYSTEM SCIENCES 27th May 2019 Shift 2 SET 1  
**Subject Name:** COMPUTER & SYSTEM SCIENCES  
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## COMPUTER & SYSTEM SCIENCES

**Group Number :** 1  
**Group Id :** 12820619  
**Group Maximum Duration :** 0  
**Group Minimum Duration :** 180  
**Revisit allowed for view? :** No  
**Revisit allowed for edit? :** No  
**Break time:** 0  
**Group Marks:** 100

## PART A

**Section Id :** 12820634  
**Section Number :** 1  
**Section type :** Online  
**Mandatory or Optional:** Mandatory  
**Number of Questions:** 75  
**Number of Questions to be attempted:** 75  
**Section Marks:** 100  
**Display Number Panel:** Yes  
**Group All Questions:** No

**Sub-Section Number:** 1  
**Sub-Section Id:** 12820646  
**Question Shuffling Allowed :** Yes

**Question Number : 1 Question Id : 128206949 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the OSI layer does synchronization and dialog control?

- a) Data link layer
- b) Network layer
- c) Session layer
- d) Transport layer

**Options :**

- 1282063761. A
- 1282063762. B
- 1282063763. C
- 1282063764. D

Question Number : 2 Question Id : 128206950 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The sampling rate for an analog signal with frequencies 1000 to 8000Hz.

- a) 4000 samples per second
- b) 8000 sample per second
- c) 12000 sample per second
- d) 16000 sample per second

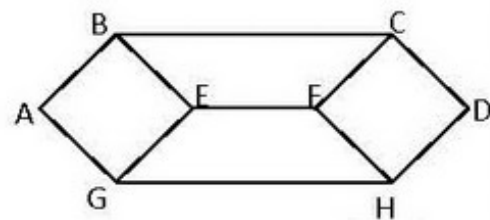
Options :

- 1282063765. A
- 1282063766. B
- 1282063767. C
- 1282063768. D

Question Number : 3 Question Id : 128206951 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the network as shown in figure. Suppose that it uses flooding as the routing algorithm. If a packet sent by A to H has a maximum hop count of 2. The number of packets that are generated are, assume, no duplicate is discarded.



- a) 2
- b) 4
- c) 6
- d) 8

Options :

- 1282063769. A
- 1282063770. B
- 1282063771. C
- 1282063772. D

Question Number : 4 Question Id : 128206952 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A network on the Internet has a subnet mask 255.255.240.0. What is the maximum number of hosts it can handle?

- a) 1
- b) 4
- c) 8
- d) 16

Options :

- 1282063773. A

1282063774. B  
1282063775. C  
1282063776. D

**Question Number : 5 Question Id : 128206953 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is non-adaptive routing?

- a) Flooding routing
- b) Distance vector routing
- c) Hierarchical routing
- d) Link state routing

**Options :**

1282063777. A  
1282063778. B  
1282063779. C  
1282063780. D

**Question Number : 6 Question Id : 128206954 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The bridge operates at the layer

- a) Application layer
- b) Transport Layer
- c) Network Layer
- d) Data link layer

**Options :**

1282063781. A  
1282063782. B  
1282063783. C  
1282063784. D

**Question Number : 7 Question Id : 128206955 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

What is the bit rate of 16-QAM signal that have the baud rate 8 baud per second

- a) 8 bits per second
- b) 16 bits per second
- c) 24 bits per second
- d) 32 bits per second

**Options :**

1282063785. A  
1282063786. B  
1282063787. C  
1282063788. D

**Question Number : 8 Question Id : 128206956 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which statement is true for Nyquist Theorem ?

- a) The sampling rate must be equal to the highest frequency
- b) The sampling rate must be equal the lowest frequency
- c) The sampling rate must be at least two times the lowest frequency
- d) The sampling rate must be at least two times the highest frequency

Options :

- 1282063789. A
- 1282063790. B
- 1282063791. C
- 1282063792. D

Question Number : 9 Question Id : 128206957 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In frequency modulation, the frequency of the carrier signal is modulated to follow the changing in

- a) Amplitude of the modulating signal
- b) Frequency of the modulating signal
- c) Phase of the modulation signal
- d) Amplitude and phase for the modulation signal

Options :

- 1282063793. A
- 1282063794. B
- 1282063795. C
- 1282063796. D

Question Number : 10 Question Id : 128206958 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What causes Thrashing in the memory management scheme?

- (a) High computing activity
- (b) High I/O activity
- (c) Low I/O activity
- (d) None

Options :

- 1282063797. A
- 1282063798. B
- 1282063799. C
- 1282063800. D

Question Number : 11 Question Id : 128206959 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is the property of the reentrant code?

- (a) it can modify itself
- (b) it cannot modify itself
- (c) it cannot be shared
- (d) None of the above

Options :

1282063801. A

1282063802. B

1282063803. C

1282063804. D

Question Number : 12 Question Id : 128206960 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The function of the ALU in the CPU is

- (a) It transfers data to primary memory
- (b) It decodes the instructions of the program
- (c) It performs logical operations
- (d) It stores intermediate data

Options :

1282063805. A

1282063806. B

1282063807. C

1282063808. D

Question Number : 13 Question Id : 128206961 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The number of entries required in FAT table of a disk with capacity of 30MB, given block size as 512b and block per cluster as 4, is

- (a)  $30 \times 2^9$
- (b)  $30 \times 2^{11}$
- (c)  $30 \times 2^{15}$
- (d)  $30 \times 2^7$

Options :

1282063809. A

1282063810. B

1282063811. C

1282063812. D

Question Number : 14 Question Id : 128206962 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In which of the memory allocation, the algorithm First Fit, Best Fit and Worst Fit are used?

- (a) Contiguous allocation
- (b) Linked allocation
- (c) Indexed allocation
- (d) All of the above

Options :

1282063813. A

1282063814. B

1282063815. C

1282063816. D

Question Number : 15 Question Id : 128206963 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What will happen to average turnaround time in a Round Robin CPU scheduling, if the time quantum is increased?

- (a) It will decrease
- (b) It will increase
- (c) It will remain constant
- (d) It will vary irregularly

Options :

1282063817. A

1282063818. B

1282063819. C

1282063820. D

Question Number : 16 Question Id : 128206964 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the use of Dirty bit in memory management?

- (a) To keep track of the wrong page
- (b) To keep track of the corrupt data in page
- (c) To keep track of least frequently used page
- (d) To keep track of the modified page

Options :

1282063821. A

1282063822. B

1282063823. C

1282063824. D

Question Number : 17 Question Id : 128206965 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The correct syntax of copy constructor for a given class X in C++ is

- (a) X(X& object)
- (b) X(X object)
- (c) X(X\* object)
- (d) X(&X object)

Options :

1282063825. A

1282063826. B

1282063827. C

1282063828. D

Question Number : 18 Question Id : 128206966 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is meant by pure virtual function?

- (a) Function which does not have definition of its own
- (b) Function which does have definition of its own
- (c) Function which does not have any return type
- (d) None of the mentioned

Options :

1282063829. A

1282063830. B

1282063831. C

1282063832. D

Question Number : 19 Question Id : 128206967 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which one of the following statement is not true for static member function

- (a) Static member functions do not have this pointer.
- (b) Static member function cannot be virtual
- (c) Static member function can not be declared const, volatile, or const volatile.
- (d) Static member functions can be called using object name.

Options :

1282063833. A

1282063834. B

1282063835. C

1282063836. D

Question Number : 20 Question Id : 128206968 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What does the following statement mean?

```
int (*fp)(char*)
```

- (a) pointer to a pointer
- (b) pointer to an array of chars
- (c) pointer to function taking a char\* argument and returns an int
- (d) function taking a char\* argument and returning a pointer to int

Options :

1282063837. A

1282063838. B

1282063839. C

1282063840. D

Question Number : 21 Question Id : 128206969 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following statement is true about continue statement?

- (a) It terminates the loop
- (b) It terminates the current iteration of the loop
- (c) It can be used or as a switch body
- (d) None of these

Options :

1282063841. A

1282063842. B

1282063843. C

1282063844. D

Question Number : 22 Question Id : 128206970 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is a correct way to declare two integer pointers a and b?

- (a) int\* a,b
- (b) int \*a, int \*b;
- (c) int \*a,\*b
- (d) None of these

Options :

1282063845. A

1282063846. B

1282063847. C

1282063848. D

Question Number : 23 Question Id : 128206971 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0



The method used to pass an array to a function is:

- (a) Value
- (b) Reference
- (c) Cannot be passed to functions
- (d) None of these

Options :

1282063849. A

1282063850. B

1282063851. C

1282063852. D

Question Number : 24 Question Id : 128206972 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The size occupied by a string literal constant in the memory is:

- (a) One more than the number of characters in the string
- (b) Same as the number of characters in the string
- (c) One less than the number of characters in the string
- (d) None of these

Options :

1282063853. A

1282063854. B

1282063855. C

1282063856. D

Question Number : 25 Question Id : 128206973 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which one of the following is a set of one or more attributes taken collectively to uniquely identify a record?

- (a) Candidate key
- (b) Sub key
- (c) Super key
- (d) Foreign key

Options :

1282063857. A

1282063858. B

1282063859. C

1282063860. D

Question Number : 26 Question Id : 128206974 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Every table with two single valued atomic attributes is in

- a) 1NF, 2NF, 3NF
- b) 1NF, 2NF but not in 3NF
- c) Only in 1NF
- d) Only in 2NF

Options :

- 1282063861. A
- 1282063862. B
- 1282063863. C
- 1282063864. D

Question Number : 27 Question Id : 128206975 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which normal form simplifies and ensures that there is minimal data aggregates and repetitive group?:

- (a) 1NF
- (b) 2NF
- (c) 3NF
- (d) All of the mentioned

Options :

- 1282063865. A
- 1282063866. B
- 1282063867. C
- 1282063868. D

Question Number : 28 Question Id : 128206976 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

From following, which is not considered to be a computer peripheral device

- a) disk drive
- b) keyboard
- c) CPU
- d) monitor

Options :

- 1282063869. A
- 1282063870. B
- 1282063871. C
- 1282063872. D

Question Number : 29 Question Id : 128206977 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ is used to store data in registers.

- a) JK flip flop
- b) RS flip flop
- c) D flip flop
- d) None of the mentioned

**Options :**

1282063873. A

1282063874. B

1282063875. C

1282063876. D

**Question Number : 30 Question Id : 128206978 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is an approach of control unit design :

- (a) Parallel programming
- (b) Micro programming
- (c) Java programming
- (d) None of above

**Options :**

1282063877. A

1282063878. B

1282063879. C

1282063880. D

**Question Number : 31 Question Id : 128206979 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a stack, if a user tries to remove an element from empty stack it is called

- a) Underflow
- b) Empty collection
- c) Overflow
- d) Garbage Collection

**Options :**

1282063881. A

1282063882. B

1282063883. C

1282063884. D

**Question Number : 32 Question Id : 128206980 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A queue is a

- a) FIFO (First In First Out) list
- b) LIFO (Last In First Out) list
- c) Ordered array
- d) Linear tree

**Options :**

1282063885. A

- 1282063886. B
- 1282063887. C
- 1282063888. D

**Question Number : 33 Question Id : 128206981 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

What is the time complexity of inserting a node in a doubly linked list?

- a)  $O(n \log n)$
- b)  $O(\log n)$
- c)  $O(n)$
- d)  $O(1)$

**Options :**

- 1282063889. A
- 1282063890. B
- 1282063891. C
- 1282063892. D

**Question Number : 34 Question Id : 128206982 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a binary search tree, which of the following traversal would print the numbers in the ascending order?

- a) Level-order traversal
- b) Pre-order traversal
- c) Post-order traversal
- d) In-order traversal

**Options :**

- 1282063893. A
- 1282063894. B
- 1282063895. C
- 1282063896. D

**Question Number : 35 Question Id : 128206983 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

We need a binary tree which is height balanced because

- a) to avoid formation of skew trees
- b) to save memory
- c) to attain faster memory access
- d) to simplify storing

**Options :**

- 1282063897. A
- 1282063898. B
- 1282063899. C
- 1282063900. D

**Question Number : 36 Question Id : 128206984 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

QuickSort can be categorized into the class

- a) Brute Force technique
- b) Divide and conquer
- c) Greedy algorithm
- d) Dynamic programming

Options :

- 1282063901. A
- 1282063902. B
- 1282063903. C
- 1282063904. D

Question Number : 37 Question Id : 128206985 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a given Moore Machine and Input='101010', the output would be of length:

- a) |Input|+1
- b) |Input|
- c) |Input-1|
- d) Cannot be predicted

Options :

- 1282063905. A
- 1282063906. B
- 1282063907. C
- 1282063908. D

Question Number : 38 Question Id : 128206986 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A Language for which no DFA exists is a

- a) Regular Language
- b) Non-Regular Language
- c) May be Regular
- d) Cannot be said

Options :

- 1282063909. A
- 1282063910. B
- 1282063911. C
- 1282063912. D

Question Number : 39 Question Id : 128206987 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Concatenation of R with  $\Phi$  outputs

- a) R
- b)  $\Phi$
- c) R. $\Phi$
- d) None of the mentioned

Options :

- 1282063913. A
- 1282063914. B
- 1282063915. C
- 1282063916. D

Question Number : 40 Question Id : 128206988 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Given Grammar:  $S \rightarrow A$ ,  $A \rightarrow aA$ ,  $A \rightarrow e$ ,  $B \rightarrow bA$ . which among the following productions are Useless productions?

- a)  $S \rightarrow A$
- b)  $A \rightarrow aA$
- c)  $A \rightarrow e$
- d)  $B \rightarrow bA$

Options :

- 1282063917. A
- 1282063918. B
- 1282063919. C
- 1282063920. D

Question Number : 41 Question Id : 128206989 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Every grammar in Chomsky Normal Form is:

- a) regular
- b) context sensitive
- c) context free
- d) all of the mentioned

Options :

- 1282063921. A
- 1282063922. B
- 1282063923. C
- 1282063924. D

Question Number : 42 Question Id : 128206990 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The value of n if Turing machine is defined using n-tuples:

- a) 6
- b) 7
- c) 8
- d) 5

Options :

- 1282063925. A
- 1282063926. B
- 1282063927. C
- 1282063928. D

Question Number : 43 Question Id : 128206991 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$(A \vee \neg A) \vee (q \vee T)$  is a

- a) Tautology
- b) Contradiction
- c) Contingency
- d) None of the mentioned

Options :

1282063929. A

1282063930. B

1282063931. C

1282063932. D

Question Number : 44 Question Id : 128206992 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The set of positive integers is

- a) Infinite
- b) Finite
- c) Subset
- d) Empty

Options :

1282063933. A

1282063934. B

1282063935. C

1282063936. D

Question Number : 45 Question Id : 128206993 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let C and D be two sets. then  $C - D$  is equivalent to

- a)  $C' \cap D$
- b)  $C \cap D'$
- c)  $C \cap D'$
- d) None of the mentioned

Options :

1282063937. A

1282063938. B

1282063939. C

1282063940. D

Question Number : 46 Question Id : 128206994 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let the sequence be 1, 3, 5, 7, 9,..... then this sequence is

- a) An arithmetic progression
- b) A geometric progression
- c) A harmonic progression
- d) None of the mentioned

Options :

1282063941. A

- 1282063942. B
- 1282063943. C
- 1282063944. D

**Question Number : 47 Question Id : 128206995 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A matrix having one row and many columns is known as

- a) Row matrix
- b) Column matrix
- c) Diagonal matrix
- d) None of the mentioned

**Options :**

- 1282063945. A
- 1282063946. B
- 1282063947. C
- 1282063948. D

**Question Number : 48 Question Id : 128206996 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The value of  $155 \pmod 9$  is

- a) 0
- b) 1
- c) 2
- d) 3

**Options :**

- 1282063949. A
- 1282063950. B
- 1282063951. C
- 1282063952. D

**Question Number : 49 Question Id : 128206997 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A function is said to be \_\_\_\_\_ if and only if  $f(a) = f(b)$  implies that  $a = b$  for all  $a$  and  $b$  in the domain of  $f$ .

- a) One-to-many
- b) One-to-one
- c) Many-to-many
- d) Many-to-one

**Options :**

- 1282063953. A
- 1282063954. B
- 1282063955. C
- 1282063956. D

**Question Number : 50 Question Id : 128206998 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**



Integration of  $(\sin(x) + \cos(x))e^x$  is

- a)  $e^x \cos(x)$
- b)  $e^x \sin(x)$
- c)  $-e^x \tan(x)$
- d)  $e^x (\sin(x) + \cos(x))$

Options :

- 1282063957. A
- 1282063958. B
- 1282063959. C
- 1282063960. D

Sub-Section Number: 2  
Sub-Section Id: 12820647  
Question Shuffling Allowed : Yes

Question Number : 51 Question Id : 128206999 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

$\int \sqrt{1 + \sin 2x} dx$  is

- a)  $\sin x - \cos x + c$
- b)  $\sin 2x - \cos x + c$
- c)  $\sin x + \cos 2x + c$
- d)  $\sin x + \cos x + c$

Options :

- 1282063961. A
- 1282063962. B
- 1282063963. C
- 1282063964. D

Question Number : 52 Question Id : 1282061000 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

$\int_{\alpha}^{\beta} \sqrt{(x - \alpha)(\beta - x)} dx, \beta > \alpha$  is

a)  $\frac{\pi}{2}(\beta - \alpha)^2$

b)  $\frac{\pi}{4}(\beta - \alpha)^2$

c)  $\frac{\pi}{8}(\beta - \alpha)^2$

d)  $\frac{\pi}{16}(\beta - \alpha)^2$

Options :

- 1282063965. A
- 1282063966. B
- 1282063967. C
- 1282063968. D

Question Number : 53 Question Id : 1282061001 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

$$\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x + \sqrt{\cos x}}} dx \text{ is}$$

- a)  $\frac{\pi}{2}$
- b)  $\frac{\pi}{4}$
- c)  $\frac{\pi}{8}$
- d)  $\frac{\pi}{16}$

Options :

1282063969. A

1282063970. B

1282063971. C

1282063972. D

Question Number : 54 Question Id : 1282061002 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

$$\int_0^3 \int_1^1 xy(1+x+y) dx dy \text{ is}$$

- a)  $30\frac{3}{4}$
- b)  $20\frac{2}{5}$
- c)  $30\frac{5}{4}$
- d)  $20\frac{3}{4}$

Options :

1282063973. A

1282063974. B

1282063975. C

1282063976. D

Question Number : 55 Question Id : 1282061003 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The value of  $\Delta \log f(x)$  is

- a)  $\log\left(1 + \frac{\Delta f(x)}{f(x)}\right) f(x)$
- b)  $\log\left(1 + \frac{\Delta f(x)}{f(x)}\right) \Delta f(x)$
- c)  $\log\left(1 + \frac{\Delta f(x)}{\Delta f(x)}\right) f(x)$
- d)  $\log\left(1 + \frac{\Delta f(x)}{f(x)}\right)$

Options :

- 1282063977. A
- 1282063978. B
- 1282063979. C
- 1282063980. D

Question Number : 56 Question Id : 1282061004 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The quotient if  $f(x) = x^4 - 4x^3 + 6x^2 - 4x + 1$  is divided by  $3x - 2$  is

- a)  $\frac{1}{3}x^3 - \frac{10}{9}x^2 + \frac{34}{27}x + \frac{40}{81}$
- b)  $\frac{1}{3}x^3 - \frac{10}{9}x^2 + \frac{34}{27}x - \frac{40}{81}$
- c)  $\frac{1}{3}x^3 + \frac{10}{9}x^2 + \frac{34}{27}x - \frac{40}{81}$
- d)  $\frac{1}{3}x^3 - \frac{10}{9}x^2 - \frac{34}{27}x - \frac{40}{81}$

Options :

- 1282063981. A
- 1282063982. B
- 1282063983. C
- 1282063984. D

Question Number : 57 Question Id : 1282061005 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

In the Gauss elimination method for solving a system of linear algebraic equations, triangularization leads to

- a) Diagonal matrix
- b) Lower triangular matrix
- c) Upper triangular matrix
- d) Singular matrix

Options :

- 1282063985. A
- 1282063986. B
- 1282063987. C
- 1282063988. D

Question Number : 58 Question Id : 1282061006 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Order of convergence of Regula-Falsi method is

- a) 1.321
- b) 1.618
- c) 2.231
- d) 2.312

Options :

- 1282063989. A
- 1282063990. B

1282063991. C

1282063992. D

Question Number : 59 Question Id : 1282061007 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The system of linear equations

$$(4d - 1)x + y + z = 0$$

$$- y + z = 0$$

$$(4d - 1)z = 0$$

has a non-trivial solution, if d equals

a)  $1/2$

b)  $1/4$

c)  $3/4$

d) 1

Options :

1282063993. A

1282063994. B

1282063995. C

1282063996. D

Question Number : 60 Question Id : 1282061008 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The Eigen values of the matrix

$$\begin{bmatrix} 5 & -6 & -6 \\ -1 & 4 & 2 \\ 3 & -6 & -4 \end{bmatrix} \text{ are}$$

a) 1, 2, 2

b) 1, 1, -2

c) 2, 1, 2

d) -2, 1, -1

Options :

1282063997. A

1282063998. B

1282063999. C

1282064000. D

Question Number : 61 Question Id : 1282061009 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The Eigen values of a skew-symmetric matrix are

- a) negative
- b) real
- c) absolute value of 1
- d) purely imaginary or zero

Options :

1282064001. A

1282064002. B

1282064003. C

1282064004. D

Question Number : 62 Question Id : 1282061010 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

What are the coordinates of the vector  $(-1, 3, 1)$  of  $V_3$  relative to the ordered basis  $B = \{(2, 1, 0), (2, 1, 1), (2, 2, 1)\}$

- a)  $-\frac{3}{2}, -\frac{5}{2}, \frac{7}{2}$
- b)  $-\frac{3}{2}, \frac{5}{2}, \frac{7}{2}$
- c)  $\frac{3}{2}, -\frac{5}{2}, \frac{7}{2}$
- d)  $-\frac{3}{2}, -\frac{5}{2}, -\frac{7}{2}$

Options :

1282064005. A

1282064006. B

1282064007. C

1282064008. D

Question Number : 63 Question Id : 1282061011 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The range of the linear transformation  $T: V_2 \rightarrow V_3$  defined by  $T(x_1, x_2) = (x_1, x_1 + x_2, x_2)$  is

- a)  $[(0,1,0), (0,1,1)]; 2$
- b)  $[(1,1,0), (0,1,0)]; 2$
- c)  $[(1,1,0), (0,1,1)]; 2$
- d)  $[(0,1,0), (1,1,0)]; 2$

Options :

1282064009. A

1282064010. B

1282064011. C

1282064012. D

Question Number : 64 Question Id : 1282061012 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

Using the formula :  $\lim_{x \rightarrow 0} \frac{a^x - 1}{x} = \log a$ , the value of  $\lim_{x \rightarrow 0} \frac{2^x - 1}{(1+x)^{1/2} - 1}$  is

- a)  $3\log 2$
- b)  $-3\log 3$
- c)  $2\log 2$
- d)  $3\log 3$

Options :

1282064013. A

1282064014. B

1282064015. C

1282064016. D

Question Number : 65 Question Id : 1282061013 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

If  $y = \frac{ax+d}{cx+d}$ , then  $y_n$ .

- a)  $\frac{(-1)^n n! (bc+ad)c^{n-1}}{(cx+d)^{n+1}}$
- b)  $\frac{(-1)^n n! (bc-ad)c^{n-1}}{(cx+d)^{n-1}}$
- c)  $\frac{(-1)^n n! (bc-ad)c^{n+1}}{(cx+d)^{n+1}}$
- d)  $\frac{(-1)^n n! (bc-ad)c^{n-1}}{(cx+d)^{n+1}}$

Options :

1282064017. A

1282064018. B

1282064019. C

1282064020. D

Question Number : 66 Question Id : 1282061014 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

If  $f(x) = f(0) + xf'(0) + \frac{x^2}{2!} f''(\theta x)$ , then the value of  $\theta$  as  $x \rightarrow 1$ , given

$f(x) = (1-x)^{5/2}$ , is

- a)  $\frac{9}{25}$
- b)  $\frac{-9}{25}$
- c)  $\frac{9}{28}$
- d)  $\frac{3}{25}$

Options :

1282064021. A

1282064022. B

1282064023. C

1282064024. D

Question Number : 67 Question Id : 1282061015 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

In a group  $(G, o)$ , the equations

$a_o x = b, y_o a = b$ , where  $a, b \in G$  have

- (a) Unique solutions in  $G$
- (b) Infinity solutions in  $G$
- (c) No solution in  $G$
- (d) None of above

Options :

1282064025. A

1282064026. B

1282064027. C

1282064028. D

Question Number : 68 Question Id : 1282061016 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

If  $(G, \cdot)$  is a group such that  $a^2 = e, \forall a \in G$ , then  $G$  is

- (a) Semi group
- (b) Abelian group
- (c) Non-abelian group
- (d) None of above

Options :

1282064029. A

1282064030. B

1282064031. C

1282064032. D

Question Number : 69 Question Id : 1282061017 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The set of all real numbers under the usual multiplication operation is not a group since

- (a) multiplication is not a binary operation
- (b) multiplication is not associative
- (c) identity element does not exist
- (d) zero has no inverse

Options :

1282064033. A

1282064034. B

1282064035. C

1282064036. D

Question Number : 70 Question Id : 1282061018 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

In the group  $G = \{2, 4, 6, 8\}$  under multiplication modulo 10, the identity element is

- (a) 2
- (b) 4
- (c) 6
- (d) 8

Options :

1282064037. A

1282064038. B

1282064039. C

1282064040. D

Question Number : 71 Question Id : 1282061019 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

If  $R = \{(1, 2), (2, 3), (3, 3)\}$  be a relation defined on  $A = \{1, 2, 3\}$ , then  $R \cdot R (= R^2)$  is

- (a) R itself
- (b)  $\{(1, 2), (1, 3), (3, 3)\}$
- (c)  $\{(1, 3), (2, 3), (3, 3)\}$
- (d)  $\{(2, 1), (1, 3), (2, 3)\}$

Options :

1282064041. A

1282064042. B

1282064043. C

1282064044. D

Question Number : 72 Question Id : 1282061020 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The binary relation  $S = \Phi$  (empty set) on set  $A = \{1, 2, 3\}$  is

- (a) neither reflexive nor symmetric
- (b) symmetric and reflexive
- (c) transitive and reflexive
- (d) transitive and symmetric

Options :

1282064045. A

1282064046. B

1282064047. C

1282064048. D

Question Number : 73 Question Id : 1282061021 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0



Which of the following sets are null sets ?

- (a)  $\{0\}$
- (b)  $\emptyset$
- (c)  $\{ \}$
- (d) Both (b) & (c)

Options :

1282064049. A

1282064050. B

1282064051. C

1282064052. D

Question Number : 74 Question Id : 1282061022 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The set of all Equivalence classes of a set A of cardinality C

- (a) has the same cardinality as A
- (b) forms a partition of A
- (c) is of cardinality  $2 \cdot C$
- (d) is of cardinality  $C^2$

Options :

1282064053. A

1282064054. B

1282064055. C

1282064056. D

Question Number : 75 Question Id : 1282061023 Question Type : MCQ Option Shuffling : No Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 2 Wrong Marks : 0

The set of all nth roots of unity under multiplication form a/an

- (a) semi group with identity
- (b) commutative semigroups with identity
- (c) group
- (d) abelian group

Options :

1282064057. A

1282064058. B

1282064059. C

1282064060. D