Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021

Course Name - -General Topology Course Code -MSCMC205

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_ .. . _ _

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- M.SC.(ANCS)
- M.SC.(MM)
- B.A.(Eng)

Answer all the questions. Each question carry one mark.

9. 1. A topological space is said to be T1 then T1

- Contains cofinite topology
- contained in cofinite topology
- contains cocountable topology
- contained in cocountable topology

10. 2. The set [0,1) in the set R with usual topology is

Mark only one oval.

open
closed
both open and closed
neither open nor closed

11. 3. The upper limit topology is generated by which of the following form of an interval

- _____ a, b)
- (a, b]
- ____ [a, b]
- 4. Which of the following subsets in R is open in co-countable topology?
 Mark only one oval.
 - Q R\Q Z Any finite set

13. 5. The number of points in a finite discrete topological space is always a/an

Mark only one oval.

____ prime number

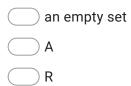
- even number
- odd number
- none of these

14. 6.

The set [0,1) in the set N with usual sub-space topology is Mark only one oval.

- Open
- ____ closed
- both open and closed
- neither open nor closed
- 15. 7.If A is a finite subset of R then the derived set of A is

Mark only one oval.



none of these

16. 8.A topological space is said to be T1 then T1

Mark only one oval.

- contains cofinite topology
- contained in cofinite topology
- contains cocountable topology
- contained in cocountable topology
- 17. 9. If X is a Hausdorff space then the number of limits of a convergent sequence is

Mark only one oval.

- 0
 1
 2
 infinitely many
- 18. 10. A metric space is

- T1 but not T2
- T2 but not T1
- both T1 and T2
- neither T1 nor T2

19. 11. If X is first countable and Hausdorff if every convergent sequence has

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🔵 no limit

- 🔵 unique limit
- finite number of limits
- infinite number of limits
- 20. 12.A regular space is always

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- 1 but not T2
- T2 but not T1
- ____ may not be T1 and T2
- both T1 and T2
- 21. 13.A T4 space is

- T1 but not normal
- normal but not T1
- both T1 and normal
- neither normal nor T1

22. 14. A metric space is:

Mark only one oval.

T1 but not normal

- normal but not T1
- both T1 and normal
- neither normal nor T1

23. 15. A space is T3 if

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- T1 but not regular
- regular but not T1
- both T1 and regular
- neither regular nor T1
- 24. 16. A T4 space is:

- T2 but not normal
- normal but not T2
- both T2 and normal
- neither normal nor T2

25. 17. The Uryshon's lemma is applicable for two disjoint

Mark only one oval.

closed sets
open sets
both open and closed sets
None of these

26. 18. By applying the Uryshon's lemma, we get a..... map that separate disjoint closed sets.

Mark only one oval.

____ open ____ closed

continuous

- 🔵 identity
- 27. 19. The number of accumulation point of a finite subset in a topological space is always

Mark only one oval.

zero
one
more than one
None of these

28. 20. Every finite T1 space is a

Mark only one oval.

indiscrete space

- discrete space
- No such space exist
- Depends on the structure
- 29. 21. Every finite subset of R with usual topology

Mark only one oval.

()	open
\sim		open

Closed

- both open and closed
- neither open nor closed
- 30. 22. Let X be a discrete finite topological space with 4 elements. Then the number of open sets of X is

Mark only one oval.



31. 23. Let X be an indiscrete finite topological space with 5 elements. Then the number of open sets of X is

Mark only one oval.



32. 24. Let X be an indiscrete finite topological space with 5 elements. Then the number of subsets of X, which are neither open nor closed is

Mark only one oval.



33. 25.

Let $X = \left\{\frac{1}{n} : n \in Z\right\}$ with co-countable topology. Then the number of open subsets of X is

Mark only one oval.

zero
 finite
 countable
 uncountable

34. 26.Which of the following statement is true?

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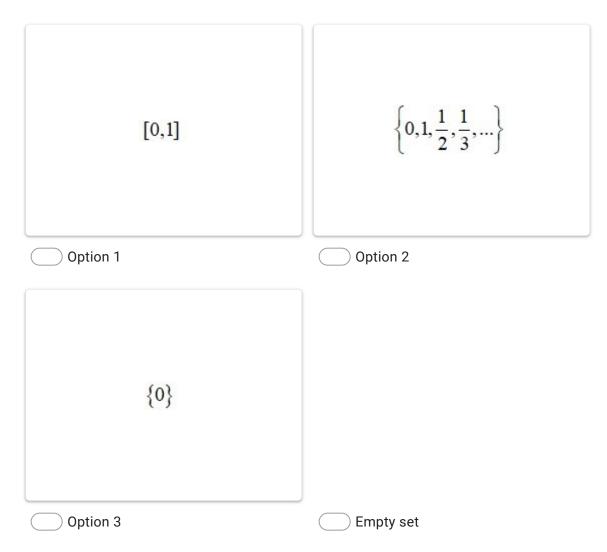
- The upper limit topology is weaker than the usual topology
- The upper limit topology is stronger than the usual topology
- The upper limit topology is not comparable with the usual topology
- None
- 35. 27. The set of interior points of A is:

- _____ the largest open set containing A
- the smallest open set containing A
- the largest open set contained in A
- _____ the smallest open set contained in A

36. 28.

$$\left\{1, \frac{1}{2}, \frac{1}{3}, \dots\right\}^{\circ} = ?$$

Mark only one oval.

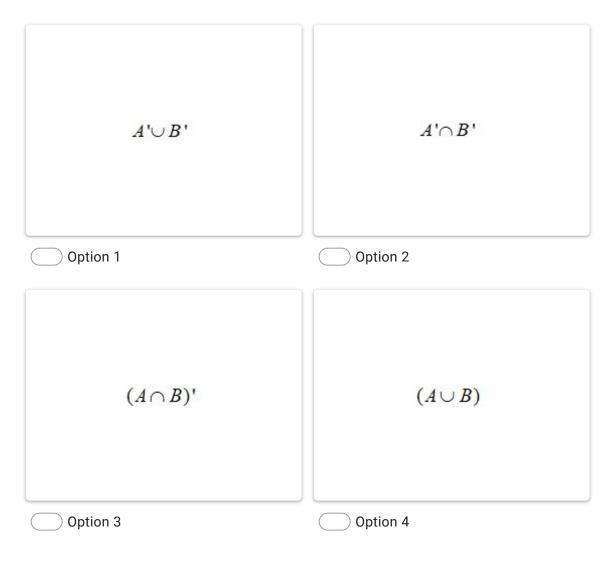


37. 29.Closure set of the set Q of all rational number is:



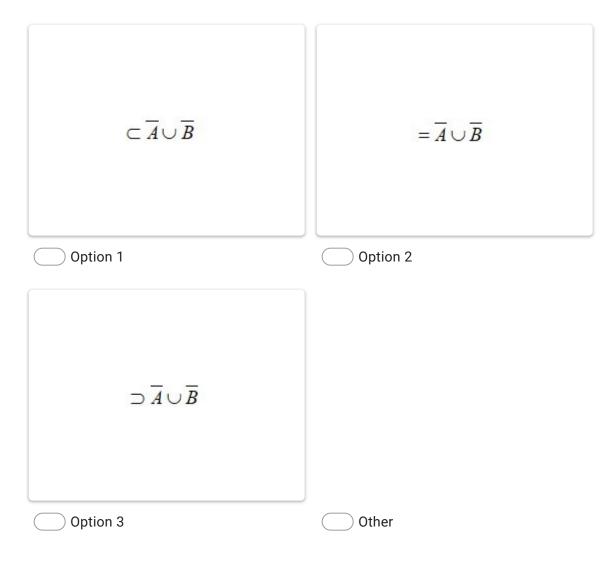
38. 30.

Let *A* and *B* be subsets of a topological space *X*. Then $(A \cup B)$ ' *Mark only one oval.*



39. 31.

$\overline{A \cup B}$ Mark only one oval.



40. 32. Every finite subset of a metric space X is:

Mark only one oval.

open
closed
both open and closed
neither open nor closed

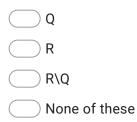
41. 33.Any subspace of a second countable space is:

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- always second countable
- ____ may not be first countable
- may not be second countable
- ____ may not be separable
- 42. 34.Derived set of the set Q of all rational number is:

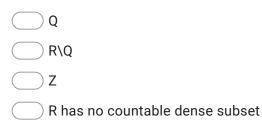
Mark only one oval.

- Q R R\Q Empty set
- 43. 35. Which of the following topological space is not second countable under usual subspace topology?



44. 36.Which is a countable dense set of R under usual topology?

Mark only one oval.



45. 37. The boundary of Q is

Mark only one oval.



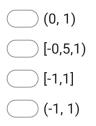
46. 38. The boundary of (0,1] is



- (0,1)
- (0)
- (1)

47. 39. Which of the following is not a neighbourhood of 0 under usual topology?

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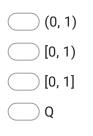


48. 40.

Let $f: X \to Y$ be a continuous map and V is a closed subset of Y. Then $f^{-1}(V)$ Mark only one oval.



49. 41. Which of the following space is homeomorphic to the space R with usual topology?



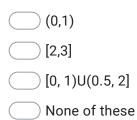
50. 42.

Let $f: X \to Y$ be a continuous map and X and Y are homeomorphic via f. Then f^{-1} is Mark only one oval.

- 🔵 always continuous
- always discontinuous
- may not be continuous
- No conclusion
- 51. 43. Let X and Y are discrete topological spaces. Then X and Y are not homeomorphic

Mark only one oval.

- Only if they have same cardinality
- if they have same cardinality
- _____ if and only if they have same cardinality
- None of these
- 52. 44.Which of the following is not homeomorphic to the space [0,1]?



53. 45. Which of the following subsets of R is not compact?

Mark only one oval.

- 🔵 a finite subset
- _____ a bounded set containing all its limit points
- an open set which is closed
- _____ a closed set which is bounded
- 54. 46.

A mapping $f: X \to Y$ is said to be an open map if *Mark only one oval.*

- it sends an open set to an open set
- it sends an open set to entire Y set
-) the inverse function sends an open set an open se
- the inverse function sends an open set to the entire X
- 55. 47. A function which maps every closed set to a closed set is called a/an

- 🔵 continuous map
- open map
- closed map
- None of these

56. 48. A function which maps every singleton set of a discrete topological space to an open sets in any topological space is called a/an

Mark only one oval.

- continuous map
- 🕖 open map
- ____ closed map
- 🔵 clopen map
- 57. 49. Arbitrary product of compact set is

Mark only one oval.

- _____ always compact
- compact if closed
- ____ may be compact
- _____ never compact
- 58. 50. If the inverse image of every open set is open then the mapping is called

- Continuous map
- open map
- 🔵 closed map
- clopen map

59. 51. Which of the following set is compact in R under usual topology?

Mark only one oval.



60. 52. If the identity function from a topological space (X, S) to (Y, T) is continuous, then

Mark only one oval.

T is finer than S
S is finer than T
T is not comparable to S

- T=S
- 61. 53.Let F be a continuous function then the inverse image of every members of subbase is

Mark only one oval.

open

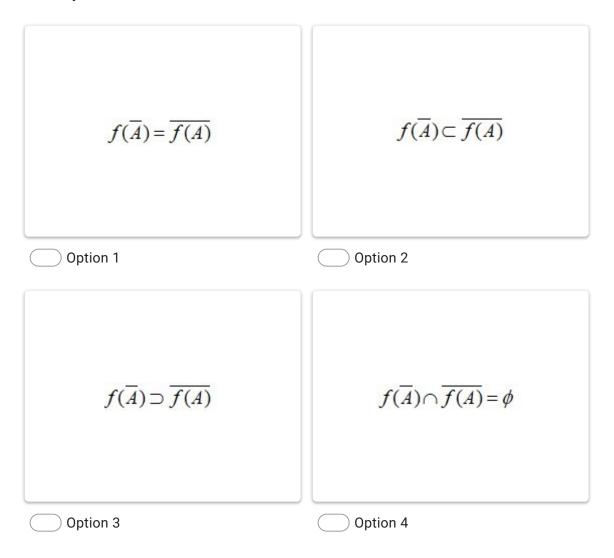
- ____ closed
- both open and closed
- neither open nor closed

62. 54. Let f be a function from a topological space to the unit interval [0, 1]. Then

Mark only one oval.

- 🔵 f is always continuous
- 🔵 f is an open map
- 🔵 f is a closed map
- None of these
- 63. 55.

A function $f: X \to X$ is continuous then Mark only one oval.



64. 56.

A function $f: X \to X$ is continuous then Mark only one oval.

- f is continuous at every points in X
- f is not continuous at some points in X
- f--1is continuous at every point in X
- Other
- 65. 57.

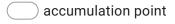
The function $f(x) = x^2$ is an open map if the topology on R is Mark only one oval.

- 🔵 usual topological space
- lower-limit topological space
- _____ upper-limit topological space
- None of these
- 66. 58. Every projection map on a product space is always

- open but not continuous
- continuous but not open
- both open and continuous
- neither open nor continuous

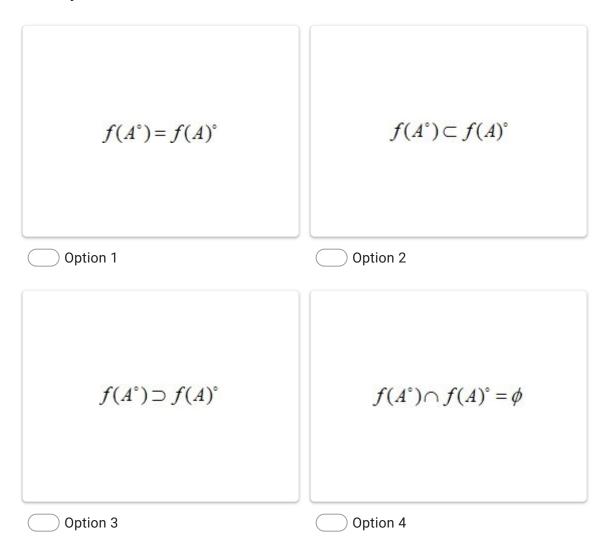
67. 59. Which of the following is not topologically invariant?

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- interior point
- 🔵 boundary point
- None of these

68. 60. None of these



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