

Write the following information in the first page of Answer Script before starting answer

ODD SEMESTER EXAMINATION: 2020-21

Exam ID Number _____

Course _____ Semester _____

Paper Code _____ Paper Title _____

Type of Exam: _____ (Regular/Back/Improvement)

Important Instruction for students:

1. Student should write objective and descriptive answer on plain white paper.
2. Give page number in each page starting from 1st page.
3. After completion of examination, Scan all pages, convert into a single PDF, rename the file with Class Roll No. (2019MBA15) and upload to the Google classroom as attachment.
4. Exam timing from 10am – 1pm (for morning shift).
5. Question Paper will be uploaded before 10 mins from the schedule time.
6. Additional 20 mins time will be given for scanning and uploading the single PDF file.
7. Student will be marked as ABSENT if failed to upload the PDF answer script due to any reason.

BACHELOR of COMPUTER APPLICATION
FIRST SEMESTER
FUNDAMENTAL CONCEPTS OF MATHEMATICS
BSM - 710

Duration : 3 hrs.

Full Marks : 70

[PART-A: Objective]

Time : 20 min.

Marks : 20

Choose the correct answer from the following:

1×20=20

1. $\sec 870^\circ = \dots$
 - a. -1
 - b. 1
 - c. 0
 - d. None
2. If $A = \{1,2,3\}$, $B = \{2,3,5\}$ then $A \Delta B =$
 - a. $\{1,3\}$
 - b. $\{1,2\}$
 - c. $\{1,5\}$
 - d. None
3. If $n(A \cup B) = 100$, $n(A) = 60$, $n(B) = 50$, then $n(A \cap B) = ?$
 - a. $n = 2$
 - b. $n = 1$
 - c. $n = 0$
 - d. $n = 3$
4. If $A = \{1,2\}$, $B = \{1,2,3\}$ then,
 - a. 20
 - b. 10
 - c. 15
 - d. None
5. If $A = \{1,2\}$, $B = \{4,5\}$ then $A^c \cap B^c =$
 - a. $A = \{1,2,3,4\}$
 - b. $A = \{4,5\}$
 - c. $A = \{2,4\}$
 - d. Φ
6. If $A = \{1,2\}$, $B = \{1,2,3\}$ then, $A^c - B^c =$
 - a. $\{3\}$
 - b. $\{4\}$
 - c. $\{5\}$
 - d. None
7. Which of the following is not a set,
 - a. Set of vowels
 - b. Set of teachers
 - c. Set of beautiful girls
 - d. All of the above
8. $\frac{d}{dx} 100x =$
 - a. 100
 - b. 0
 - c. 10
 - d. 1000

9. $\frac{d}{dx} x^n =$
- x^n
 - nx^n
 - nx^{n-1}
 - n^x
10. $\frac{d}{dx} \sec ax =$
- $\sec ax$
 - $a \sec ax$
 - $a \sec ax. \tan ax$
 - None
11. $A = \begin{pmatrix} 2 & 1 \\ 6 & 3 \end{pmatrix}$ is a
- Square matrix
 - Singular matrix
 - Both A and B
 - None
12. $\begin{vmatrix} 1 & 2 & 3 \\ 1 & 4 & 5 \end{vmatrix} =$
- 2
 - Can not be determined
 - 0
 - 112
13. If $A = \begin{pmatrix} 2 & 1 \\ 3 & 4 \end{pmatrix}$ then,
- $|A| = |A'|$
 - $|A| \neq |A'|$
 - Both a. and b.
 - None
14. If $A = \begin{pmatrix} 2 & -4 \\ -1 & 3 \end{pmatrix}$ the co-factor of -4 is,
- 3
 - 3
 - 1
 - 1
15. If A be a matrix then, A^{-1} exists, only when
- $|A| = 0$
 - $|A| \neq 0$
 - $A \neq 0$
 - None

16. $\frac{d}{dx} e^{\sqrt{8x}} =$

- a. $-8e^{-8x}$
- c. e^{-x}

- b. e^{-8x}
- d. None

17. $f(x) = 2x + 5$ is

- a. One-one
- c. Both A and B

- b. onto
- d. None

18. $\int x^{-m} dx =$

- a. mx^m
- c. $\frac{x^{m+1}}{m+1}$

- b. mx
- d. None

19. $\int \cot^2 x dx =$

- a. $\sec^2 x$
- c. $\tan x$

- b. $\tan x - x$
- d. None

20. $\int \sec^4 x dx$

- a. $\tan x$
- c. $\sec x \tan x$

- b. $\sec x$
- d. None

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(PART-B : Descriptive)

Time: 2 hrs. 40min.

Marks:50

[Answer question no.1 & any four (4) from the rest]

1. a. If $A = \begin{pmatrix} -1 & 1 & 2 \\ 4 & 2 & 5 \\ 1 & 3 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 2 & -1 & 3 \\ 2 & 4 & -1 \\ 1 & 2 & 3 \end{pmatrix}$ Find AB and BA 6+4=10
- b. Find, $\frac{dy}{dx}$, if $y = 3e^{-5x} + 7x \log x + 10$
2. a. . Evaluate, $\int (e^{-5x} + \frac{5}{x^4} + 7x^{-3} - 10x) dx$ 5+5=10
- b. . Find, $\frac{dy}{dx}$, if $y = e^{3x} \sin 4x$
3. a Evaluate, $\int (x^2 \log x) dx$ 5+5=10
- b Find, $\frac{dy}{dx}$, if $y = \frac{4}{x^5} + \frac{3}{x} + 3\sqrt{x} + 20$
4. For any two sets A and B , show that, 5+5=10
- a. $(A \cap B)^C = A^C \cup B^C$
- b. $A \cap B^C = A - B$

5. a. Test whether following functions are one or onto **4+3+3=10**
- (i) $f(x) = 5x + 3$
- (ii) $f(x) = x^2$
- b. Distinguish between equal set and equivalent set
- c. $\lim_{x \rightarrow 2} \frac{x-2}{\sqrt{x}-\sqrt{2}}$
6. a. If, $A = \begin{pmatrix} 1 & k \\ 4 & 2 \end{pmatrix}$, find k if A is singular matrix **3+4+3=10**
- b. Evaluate, $\int (x^2 e^x) dx$
- c. Find, $\frac{dy}{dx}$, if $y = \tan x + \frac{1}{\tan x}$
7. a. Find, $\frac{dy}{dx}$, if $y = (x^2 + x + c)^2$ **5+5=10**
- b. Find, $\frac{dy}{dx}$, if $y = \frac{e^{-x} - e^x}{e^{-x} + e^x}$
8. a. Show that $(p \wedge \sim q) \wedge (\sim p \vee q)$ is a contradiction. **5+5=10**
- b. Show that $\sim(p \vee q)$ and $\sim p \wedge \sim q$ are logically equivalent.

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