

**BACHELOR OF COMPUTER APPLICATION
FIRST SEMESTER [REPEAT]
FUNDAMENTAL CONCEPTS OF MATHEMATICS
BSM – 710 [BRIDGE COURSE]
[USE OMR SHEET FOR OBJECTIVE PART]**

**SET
A**

Duration: 3 hrs.

Full Marks: 70

[Objective]

Time: 30 min.

Marks: 20

Choose the correct answer from the following:

1X20=20

- If $A = \{1,2\}$ and $B = \{3,4\}$ then $A - B =$
 - 4
 - 1
 - 0
 - None
- $a^m \cdot a^n =$
 - a^{mn}
 - $(a^2)^{mn}$
 - a^{m+n}
 - a^{m-n}
- If $x^{2n+1} = x^{n+3}$
 - $n = 2$
 - $n = 1$
 - $n = 0$
 - $n = 3$
- If $A = \{1,2\}$, $B = \{1,2,3\}$ then,
 - $A \subseteq B$
 - $A < B$
 - $A \in B$
 - None
- If $A = \{1,2\}$, $B = \{4,5\}$ then $A \cap B =$
 - $A = \{1,2,3,4\}$
 - $A = \{4,5\}$
 - $A = \{2,4\}$
 - Φ
- If $A = \{1,2\}$, $B = \{1,2,3\}$ then, $B - A =$
 - $\{3\}$
 - $\{4\}$
 - $\{5\}$
 - None
- Which of the following is not a set,
 - Set of vowels
 - Set of teachers
 - Set of beautiful girls
 - All of the above
- $\frac{d}{dx} 15 =$
 - 100
 - 0
 - 10
 - 1000

9. $\frac{d}{dx} ax^n =$
 a. x^n b. nx^n
 c. anx^{n-1} d. n^x
10. $\frac{d}{dx} \sec bx =$
 a. $\sec bx$ b. $a \sec ax$
 c. $b \sec bx \cdot \tan bx$ d. None
11. $\begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix} =$
 a. 1 b. 0
 c. 0 d. -1
12. $\begin{vmatrix} 1 & 2 & 3 \\ 1 & 4 & 5 \end{vmatrix} =$
 a. -2 b. Can not be determined
 c. 0 d. 112
13. If $A = \begin{pmatrix} 2 & 1 \\ 3 & 4 \end{pmatrix}$ then,
 a. $|A| = |A'|$ b. $|A| \neq |A'|$
 c. Both a. and b. d. None
14. If $A = \begin{pmatrix} 3 & 1 \\ -1 & 4 \end{pmatrix}$ the co-factor of 4 is,
 a. 3 b. -3
 c. -1 d. 1
15. If A be a matrix then, A^{-1} exists, only when
 a. $|A| = 0$ b. $|A| \neq 0$
 c. $A \neq 0$ d. None
16. $\frac{d}{dx} e^{-7x} =$
 a. $-7e^{-7x}$ b. e^{-7x}
 c. e^{-x} d. e^x

17. $\int dx =$

- a. x
- c. x^2

- b. $x + c$
- d. None

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

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

- b. mx
- None
- d.

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

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

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

20. $\int \frac{3}{x} dx$

- a. x^3
- c. $3 \log x$

- b. $\log x$
- d. $x \log 3$

(Descriptive)

Time : 2 hrs. 30 min.

Marks : 50

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

1. If $U = \{a, b, c, d, e, f\}$ 10
 $A = \{a, d, e, f\}$
 $B = \{a, b, d\}$
then find $A \cup B, A \cap B, A - B, B - A, AXB$
2. a. Make a truth table for $\sim p \wedge q$ 5+5=10
- b. If $A = \begin{pmatrix} 1 & 4 & 2 \\ 4 & 4 & 6 \end{pmatrix}$ and $B = \begin{pmatrix} -3 & 2 \\ 5 & 2 \\ 7 & 1 \end{pmatrix}$ then find AB and BA .
3. a. Simplify, $\frac{(e^x)^{3y} \cdot e^{2y} \cdot e^y}{(e^y)^3 \cdot e^{3xy}}$ 5+5=10
- b. Find, $\frac{dy}{dx}$, if $y = 3e^{-x} + 7x^3 \log x + 29$
4. a. Evaluate, $\int (e^{-x} + \frac{1}{x^3} + 7x^3 + 20) dx$ 5+5=10
- b. Find, $\frac{dy}{dx}$, if $y = e^{3x} \cos 4x$
5. a. Evaluate, $\int (10e^x \log x) dx$ 5+5=10
- b. Find, $\frac{dy}{dx}$, if $y = \frac{5}{x^4} + \frac{6}{x^3} + \frac{2}{x^2} + 20$

6. a. If, $A = \begin{pmatrix} 1 & 2 \\ 4 & 2 \end{pmatrix}$, find A^3 5+5=10

b. Evaluate, $\int (x^7 + \frac{1}{x} + e^{-4x}) dx$

7. For any two sets A and B , show that. 5+5=10

a. $(A \cup B)^C = A^C \cap B^C$

b. $A \cap B^C = A - B$

8. Show that, 10

a. $\sim (p \vee q) = \sim p \wedge \sim q$

b. $\sim (p \wedge q) = \sim p \vee \sim q$

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