REV-01
BCA/01/05

2024/07

SET A

BACHELOR of COMPUTER APPLICATION
FIRST SEMESTER
FUNDAMENTAL CONCEPTS OF MATHEMATICS
BSM – 710 [SPECIAL REPEAT]

[USE OMR SHEET FOR OBJECTIVE PART]

Duration : 3 hrs. Full Marks : 70

(Objective)

Time : 30 min. Marks : 20

Choose the correct answer from the following: ***1×20=20***

1. $Sec870^{\circ} ==\ldots$
   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. $\frac{d}{dx}x^n =$

a. x^n b. nx^n

c. nx^{n-1} d. n^x

10. $\frac{d}{dx}\sec ax =$

a. $\sec ax$ b. $a\sec ax$

c. $a\sec ax.\tan ax$ d. None

11. $A = \begin{pmatrix} 2 & 1 \\ 6 & 3 \end{pmatrix}$ is a

a. Square matrix b. Singular matrix

c. Both A and B d. None

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 $A = \begin{pmatrix} 2 & -4 \\ -1 & 3 \end{pmatrix}$ 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. $\frac{d}{dx}e^{\sqrt{8x}} =$

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

b. e^{-8x}

c. e^{-x}

d. None

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

a. One-one

b. onto

c. Both A and B

d. None

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

a. mx^m

b. mx

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

d. None

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

a. $\sec^2 x$

b. $\tan x - x$

c. $\tan x$

d. None

20. $\int Sec4x dx$

a. $\tan x$

b. $Secx$

c. $Secx \tan x$

d. None

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(Descriptive)

Time: 2 hrs. 30min. **Marks:50**

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

1. **6+4=10**

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

b. Find, $\frac{dy}{dx}$, if $y=3e^{-5x}+7x\log x+10$

2. **5+5=10**

a. . Evaluate, $\int(e^{-5x}+\frac{5}{x^4}+7x^{-3}-10x)dx$

b. . Find, $\frac{dy}{dx}$, if $y=e^{3x}Sin4x$

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 eaual set and equivalent set

c. $\lim_{x\to 2}\dfrac{x-2}{\sqrt{x}-\sqrt{2}}$

6. **3+4+3 =10**

a. If, $A=\begin{pmatrix}1 & k\\ 4 & 2\end{pmatrix}$, find k if A is singular matrix

b. Evaluate, $\int(x^2e^x)dx$

c. Find, $\dfrac{dy}{dx}$, if $y=\tan x+\dfrac{1}{\tan x}$

7. **5+5=10**

a.Find, $\dfrac{dy}{dx}$, if $y=(x^2+x+c)^2$

b. Find, $\dfrac{dy}{dx}$, if $y=\dfrac{e^{-x}-e^x}{e^{-x}+e^x}$

8. a. Show that $(p\wedge\sim q)\Lambda(\sim p\vee q)$ 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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