K15U 0060
Reg. No. : $\qquad$
Name: $\qquad$

III Semester B.Com./B.B.A./ B.B.A.T.T.M./B.B.A.R.T.M. Degree (CCSS-Supple./Imp.) Examination, November 2015
General Course for B.Com./B.B.A./ B.B.A.T.T.M./B.B.A.R.T.M./ 3A12 COM./B.B.A./B.B.A.(T)/B.B.A.R.T.M. NUMERICAL SKILLS (2012 /13 Admissions)

Time: 3 Hours
Max. Weightage : 30
PART-A

This part consist of two bunches of questions carrying equal Weightage of one. Each bunch consist of 4 objective questions. Answer all questions.
I. 1) $X=4+8 Y$ is $\qquad$
[a) quadratic
b) linear
c) exponential
d) none of these]
2) The roots of the equation $3 x^{2}-1=0$ are
[a) irrational
b) imaginary
c) rational
d) iniegers]
3) The value of the determinant $\left|\begin{array}{ll}5 & 6 \\ 3 & 4\end{array}\right|$ is
[a) 2
b) -2
c) 38
d) -38$]$
4) $\phi$ is $\qquad$
[a) not a set
b) not a subset
c) subset of every set
d) not existing]

1I. 5) Let $A=\{a, b, c\}, B=\{b, c, d\} C=\{a, b, d, e\}$ then $A \cap(B \cup C)$ is
[a) $(a, b, c)$
b) $(b, c, d)$
c) $(a, d, b, e)$
d) 9$]$
P.t.o.
6) If $A=\{1,2\}$ and $B=\{2,1,1\}$ are
[a) equal
b) equivalent
c) either
d) similar]
7) The sum at the end of 4 years, for Rs. 100 at $10 \%$ per annum C.I payable quarterly is
[a) $100(1.1)^{3}$
b) $100(1.025)^{4}$
c) $100(1.025)^{16}$
d) $\left.100(1.1)^{4}\right]$
8) Value of the determinant $\left|\begin{array}{lll}2 & 1 & 3 \\ 4 & 2 & 6 \\ 6 & 3 & 9\end{array}\right|$ is
[a) 0
b) positive integer
c) negative integer
d) not obtainable]

## PART - B

Answer any eight questions in one ortwo sentences each. Each question carries a Weightage of one.
9) On what sum of money will the compound interest for 2 years at $5 \%$ per annum amount to Rs. 768.75 ?
10) If $a: b=3: 8$, find the value of $\frac{4 a+3 b}{6 a-b}$.
11) If the ratio between 8 and 11 is the same as the ratio of $2 x-y$ to $x+2 y$, find the value of $\frac{7 x}{9 y}$.
12) Two chemicals $A$ and $B$ are mixed in the proportion $4: 1$ and the mixture stored in a container. The same two chemicals are mixed in the proportion 7:3 and the mixture stored in another container. What quantities should be drawn from the two containers to prepare 11 litres of mixture in which the two chemicals are in the proportion 8:3?
13) Mr. A lent at simple interest Rs. 7,200 partly at $6 \%$ p.a and partly at $7 \%$ p.a. If the interest received after one year is Rs. 450 , how much did he lend at different rate of interest?
14) A machine depreciates in value each year at $10 \%$ of its previous value and at the end of the fourth year its value is Rs. $1,31,220$. Find the original value.
15) Find the total present value of each cash inflows at the end of each year shown below.

| Year : | 1 | 2 | 3 | 4 | 5 |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Cash in flow : | 2000 | 3000 | 3500 | 3000 | 4000 |

The rate of interest is $8 \%$

$$
I^{\text {st }} \text { year } \quad \|^{\text {nd }} \text { year } I I^{\text {rd }} \text { year } \quad \mathrm{V}^{\text {th }} \text { year } \mathrm{V}^{\text {th }} \text { year }
$$

$\begin{array}{llllll}\text { PV factor: } & 0.926 & 0.857 & 0.794 & 0.735 & 0.681\end{array}$
16) If $A=\{1,2,3\}, B=\{3,4,5\}, C=\{1,3,5\}$ prove that $A-(B \cup C)=(A-B) \cap(A-C)$.
17) Represent the following using Venn diagram.

$$
(A \cup B) \cap(A \cup C)
$$

18) Solve $3 x^{2}+4 x+1=0$.
(Wt. $8 \times 1=8$ )
PART-C

Answer any sixquestions. Each question carries Weightage of two.
19) If $a=x-\sqrt{x^{2}-1}$ show that $a+\frac{1}{a}=2 x$.
20) Solve $x+y=1, y+z=1, z+x=4$.
21) Solve the equation $2 x+\frac{5}{x}=7$.
22) Simplify $\frac{3^{5} 27^{3} \cdot 9^{4}}{3(81)^{4}}$.
23) Given $A=\left[\begin{array}{ll}2 & -3\end{array}\right], B=\left[\begin{array}{ll}0 & 2\end{array}\right]$ and $C=\left[\begin{array}{ll}-1 & 4\end{array}\right]$ find the matrix $X$ in each of the following:
i) $\mathrm{X}+\mathrm{B}=\mathrm{C}-\mathrm{A}$
ii) $A-X=B+C$.
24) Solve the equation $X+\left[\begin{array}{rrr}0 & 1 & 5 \\ 1 & 0 & 4 \\ 2 & -6 & 8\end{array}\right]=\left[\begin{array}{lll}1 & 2 & 3 \\ 2 & 3 & 1 \\ 3 & 2 & 1\end{array}\right]$.
25) If $A=\left[\begin{array}{rrr}2 & 3 & 4 \\ 5 & 7 & 9 \\ -2 & 1 & 1\end{array}\right]$ and $B=\left[\begin{array}{lll}4 & 0 & 5 \\ 1 & 2 & 0 \\ 0 & 3 & 1\end{array}\right] \begin{gathered}\text { verify that }(A B)^{\prime}=B^{\prime} A^{\prime} \text {. }\end{gathered}$
26) Show that $\left|\begin{array}{lll}3 & 8 & 2 \\ 2 & 1 & 0 \\ 1 & 3 & 2\end{array}\right|>0$
(Wt. 6×2=12)
PART-D

Answer any two questions. Each questions carries a Weightage of 4 .
27) Solve completely the following equations :
$2 x-3 y=3$ and
$4 x-y=11$ using matrices.
28) Find the rank of $\left[\begin{array}{cccc}1 & 2 & 0 & 5 \\ 3 & 1 & 2 & 2 \\ 2 & 4 & 0 & 10\end{array}\right]$.
29) Show that $\frac{1}{1+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+2}$ is rational.
(Wt. 2×4=8)

