



Name :

Roll No. :

Invigilator's Signature :

CS/BBA(H), BIRM, BSCM/SEM-1/BBA-102/2012-13

2012

MATHEMATICS-I

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

i) The value of $\log_{\frac{1}{2}} 64$ is

- a) 6
- b) - 6
- c) $\frac{1}{6}$
- d) $-\frac{1}{6}$.

ii) The term containing x^8 in $(1 + x^2)^{10}$ is

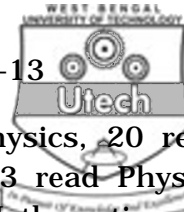
- a) 5th
- b) 4th
- c) 6th
- d) 7th.

iii) Slope of the line parallel to the line joining the points $(2, 5)$ and $(-4, 3)$ is

- a) - 3
- b) 3
- c) $1/3$
- d) $-1/3$.

iv) $(\sqrt{2+1})^6 + (\sqrt{2-1})^6 =$

- a) 180
- b) 90
- c) 198
- d) 99.



- c) In a class of 50 students, 15 read Physics, 20 read Chemistry and 20 read Mathematics, 3 read Physics and Chemistry, 6 read Chemistry and Mathematics and 5 read Physics and Mathematics and 7 read none of the subject. How many students read all the subjects ?
 $5 + 5 + 5$
8. a) Divide 21 into three parts, which will be in A.P., such that the product of the first and second parts is 28.
 b) If $f(x) = \frac{1-x}{1+x}$ find $f\left\{f\left(\frac{1}{x}\right)\right\}$.
 c) Show that $2 + \sqrt{17}$ is not a rational number. $5 + 5 + 5$
9. a) In a G.P. p-th, q-th and r-th terms are respectively a, b, c . Show that $a^{q-r} b^{r-p} c^{p-q} = 1$.
 b) If $x^2 + y^2 = 14xy$, prove that $2 \log \frac{x+y}{4} = \log x + \log y$.
 c) If $\frac{x}{y+z} = \frac{y}{z+x} = \frac{z}{x+y}$, then show that $x + y + z = 0$ or each fraction = $\frac{1}{2}$. $5 + 5 + 5$
10. a) What is the present value of Rs. 1000 due in 2 years at 5% compounded interest according as the interest is paid (i) yearly (ii) half-yearly.
 b) Apply the principle of mathematical induction to prove $\frac{1}{4.7} + \frac{1}{7.10} + \frac{1}{10.13} + \dots + \frac{1}{(3n+1).(3n+4)} = \frac{n}{4(3n+4)}$
 c) Solve : $2^{x+2} + 2^{x-1} = 9$. $5 + 5 + 5$
11. a) Find the locus of the point, the ratio of whose distances from the line $x = 2$ and from the point $(5, -1)$ is $3 : 2$.
 b) State De Morgan's laws.
 If $U = \{-1, -2, 0, 3, 5, 10, 12, 13, 16\}$,
 $P = \{-2, 3, 5, 12\}$, $Q = \{-1, -2, 0, 5, 12, 13\}$, then verify De Morgan's Laws.
 c) Find the equation of the circle through the points $(4, 3)$ and $(-2, 5)$ and having its centre on the line $2x - 3y = 4$.