OMT-101

ASSIGNMENT BOOKLET

Bachelor's Preparatory Programme
PREPARATORY COURSE IN GENERAL MATHEMATICS
(Valid from 1st July, 2013 to 31st March, 2014)

School of Sciences
Indira Gandhi National Open University
Maidan Garhi
New Delhi-110068
(July 2013 Cycle)

OMT-101 – ASSIGNMENT COMPONENT

Dear Student,

This assignment booklet consists of certain questions related to the printed study material that has been sent to you. It is necessary to do this assignment as it constitutes the continuous evaluation component of this course.

The main purpose of this assignment is to help you assess your grasp of the learning material. The information given in the printed course material should be sufficient for answering the assignment.

You have to complete the assignment in time. You will not be allowed to appear for the term-end examination if you do not submit the assignment in time. If you appear in the term-end examination without submitting the assignment, then the result of the term-end examination is liable to be cancelled.

Please submit your assignment before 31st March, 2014.

The counselor attached to your study centre will be evaluating your assignment as well as OMR sheet and will give the comments on them within a month after submission. These comments will give you some feedback regarding your understanding of the subject.

For your own record, **retain a copy** of all the assignment responses which you submit to the Coordinator of your study centre. If you do not get back your evaluated assignments along with the comments on them within a month after submission, please ask your study centre coordinator for them.

In case you are unable to submit the assignment responses then you have to wait for the assignments meant for the next batch of students. **The request for the new assignment may be addressed to the Assistant Registrar, Material Production & Distribution Division, Indira Gandhi National Open University, Maidan Garhi, New Delhi-110068, in the month of January/February in the prescribed form printed in this programme guide.** (Assignments are also available from the IGNOU website www.ignou.ac.in. You can access them by clicking on the links "Student Zone ⟶ Assignments ⟶ BPP".)

Instructions for Formating Your Assignments

Before attempting the assignment please read the following instructions carefully.

1) On top of the first page of your answer sheet, please write the details exactly in the following format:

ROLL NO :……

NAME :……

ADDRESS :……

……

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COURSE CODE: …….

COURSE TITLE : …….

ASSIGNMENT NO. ……..…

STUDY CENTRE: ……...….. DATE:

…….……...

PLEASE FOLLOW THE ABOVE FORMAT STRICTLY TO FACILITATE EVALUATION AND TO AVOID DELAY.

2) Use only foolscap size writing paper (but not of very thin variety) for writing your answers.

3) Leave 4 cm margin on the left, top and bottom of your answer sheet.

4) Your answers should be precise.

5) While solving problems, clearly indicate which part of which question is being solved.

6) **This assignment (along with the filled OMR sheet) is to be submitted to the Study Centre**.

7) This assignment is valid only upto **March 31st , 2014**.

We strongly suggest that you **retain a copy of your answer sheets**.

We wish you good luck.

Assignment (OMT-101)
(To be done **after** studying the course material**)**

Course Code: OMT-101
Assignment Code: OMT-101/2013-14
Maximum Marks: 100

Section – A

1. a) What are the binary representations of the following decimal numbers?
17, 29, 38 (3)

b) How will you represent the following numbers in Roman numerals?
210, 450, 530, 345 (2)

c) Use number line to evaluate the following
i) $-5+(-3)$
ii) $4-(-4)$ (2)

d) Assume that the population of India is 120 million. If 40.25% of the population has height below 5 ft. and 30.76% of the population has height between 5 and 5.5 ft. Find how many people have height greater than 5.5 ft., rounding off your result to 2 decimal places. (3)

2. a) Rama Kant has a Gold coin of 150 gms. He distributed $\frac{1}{6}$, $\frac{3}{5}$ and $\frac{1}{5}$ of the coin to his three daughters. Now how much gold is left with Rama Kant? (2)

b) Arrange the following numbers in ascending order.
$\frac{1}{9}, \frac{2}{7}, \frac{6}{5}, \frac{11}{12}, \frac{7}{3}, \frac{1}{3}, \frac{4}{7}, \frac{8}{5}$ (2)

c) Simplify the following
i) $\frac{\sqrt{2700}\times\sqrt{30}}{\sqrt{40}}$ ii) $\frac{2^4\times3^4}{5^2}\div\frac{6^2}{5}$
iii) $\frac{4^{-2}\times(-10)^3}{(-5)^3}$ iv) $\sqrt{(7^2+8^2)^{1/2}\times113^{1/2}+2^3}$ (4)

d) The scale of a map is given as 1:2, 00000. Two cities are 3 cm apart on the map. Calculate the actual distance between them. (2)

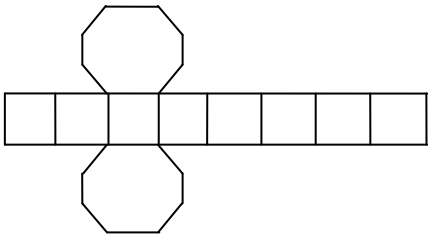
3. a) Split 597 into three parts such that these are in A.P. and the product of the two smallest parts is 796. (3)

b) In how many ways can the letters of MAHABHARAT be arranged so that
i) B and T are never together
ii) M, A, T, H occurs at first four places. (4)

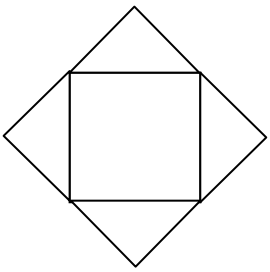
c) The ratio of number of male workers and female workers in a company is 5:1. If the company has 250 male workers, how many female workers are there in the company? How many more female workers are need to be recruited so that the ratio becomes 1:1? (3)

4. a) Consider the following diagrams below

i)

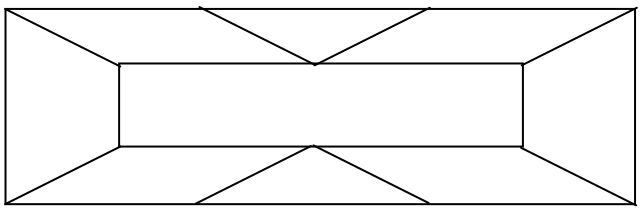


ii)



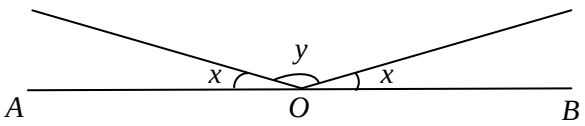
Copy these diagrams on some stiff paper and cut out along their outer edges. Make solid shapes from these cutouts. What shapes they represent? Find the number of faces, vertices and edges for both the shapes. (4)

b) Find the number of triangles, rectangles, parallelograms and trapeziums in the following figure. (3)

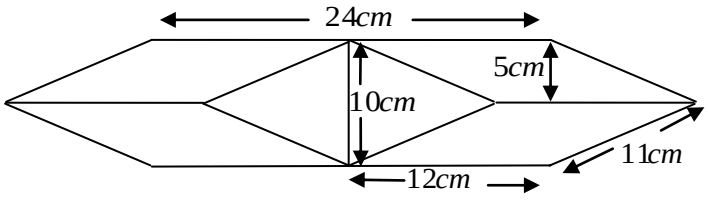


c) Find the value of x in the following figure so that AOB become a straight line if

i) $y = 2x$ ii) $y = 150^{\circ}$ (3)



5. a) Find the total area of the figure given below (3)



b) Two cones with same base radius 4 cm and height 8 cm are joined together along their bases. Find the surface area of the shape so formed. (3)

c) Plot the equation $3x + 4y = 7$ on the graph paper taking four points. Also plot the equation $y = x$ on the same graph paper. At what point do the two lines meet? (4)

6. a) Ramesh buys 150 shares of par value ₹ 10/- each of a company which pays annual dividend of 15% at such a price that he receives 10% on his investments. What is the market value of share? (4)

b) Find the sum of the following series
$4.1 + 5.2 + 6.3 + 7.4 + \cdots + 52.49$. (3)

c) At what rate of interest per annum, the amount ₹ 10, 000/- will be doubled in 5 years, interest being compounded quarterly? (3)

7. a) Find the mean, variance and standard deviation for the following data
6, 12, 6, 8, 10, 8, 12, 8, 14, 16 (4)

b) The weekly wages (in ₹) of 30 workers in a factory are given below:

830, 835, 834, 860, 890, 900, 920, 980, 990, 860,
870, 830, 860, 900, 925, 920, 835, 890, 870, 970,
920, 990, 860, 825, 830, 830, 810, 815, 820, 915

Make a frequency distribution table having the classes 800-825, 826-850, …, 976-1000. Draw a bar diagram and find the number of workers falling in the highest and lowest classes. (6)

8. a) Write down the following events as sets and also write the corresponding sample space.
i) An odd appears in a single toss of a fair die.
ii) At least one head appears in two tosses of a fair coin. (2)

b) Two students Himesh and Krishna appeared in an examination. The probability that Himesh will qualify the examination is 0.05 and that the probability that Krishna will qualify the examination is 0.21. The probability that both will qualify the examination is 0.03. Find the probability that
i) Both Himesh and Krishna will not qualify the examination.
ii) Only Himesh will qualify the examination
iii) Only Krishna will qualify the examination
iv) Only one of them will qualify the examination. (4)

c) In a family of two children, find the probability that the family has two boys given that the first child is a boy. (2)

d) How much does it cost to paint a triangular surface of sides 6 m, 5 m and 11 m at the rate of ₹ 20/- per m^2? (2)

Assignment (OMT-101)
(July 2013 – March 2014)

Section – B

The following 20 questions are multiple choice types. Only one of the four alternatives given in each is correct. You have to identify the correct answer. Each question is worth **1 mark**. You have to give the answers in the **OMR sheet attached with this** and submit it along with your answers to the other questions, for evaluation. Please read the instructions given for filling the OMR sheet, carefully before you start filling your answers. (**Please note that this is the format appearing in your Term End Examination.**)

1. $1\frac{2}{3}\times 2\frac{3}{4}\times 3\frac{3}{5}$ is equal to

   1) $15\frac{1}{3}$ 2) $14\frac{1}{4}$

   3) $16\frac{1}{2}$ 4) $17\frac{1}{2}$

2. What is the value of $\frac{51\div 3+(-3\times 10+1)}{-2}$?

   1) -6 2) 6

   3) 8 4) -8

3. If you divide $5\frac{2}{3}$ by $3\frac{2}{5}$ and then multiply the result by $2\frac{2}{3}$, what will you get?

   1) $4\frac{1}{3}$ 2) $3\frac{2}{5}$

   3) $3\frac{1}{3}$ 4) $5\frac{2}{3}$

4. Which is the correct order?

   1) $3.901 < 3.899 < 3.974 < 3.975$
   2) $3.899 < 3.901 < 3.974 < 3.975$
   3) $3.975 < 3.974 < 3.901 < 3.899$
   4) $3.974 < 3.975 < 3.901 < 3.899$

5. Which of the following is not equal to $\left[\left(\frac{a}{b}\right)^{\frac{1}{2}}\right]^{-\frac{1}{3}}$?

   1) $\left(\frac{a}{b}\right)^{\frac{1}{2}-\frac{1}{3}}$ 2) $\frac{1}{\left(\left(\frac{a}{b}\right)^{\frac{1}{2}}\right)^{\frac{1}{3}}}$

3) $\left(\frac{b}{a}\right)^{\frac{1}{6}}$ 4) $\left(\frac{a}{b}\right)^{-\frac{1}{6}}$

6. Which of the following is irrational?
1) 0.26 2) 0.26161616...
3) 0.2616616616... 4) 0.26161161116…

7. Any solution of the equation $3x + 0y - 7 = 0$ in two variables is of the form
1) $\left(\frac{7}{3}, m\right)$ 2) $(-7, 0)$
3) $(7, 0)$ 4) $\left(-\frac{7}{3}, m\right)$

8. The equation $6x - 7y = 5$ has a unique solution if x, y are:
1) Real numbers 2) Rational numbers
3) Irrational numbers 4) Natural numbers

9. If the common difference of an A.P. is 7, then what is $a_{20} - a_{11}$?
1) 64 2) 65
3) 66 4) 63

10 If $40C(n, 5) = C(n, 3)$, then what is $C(n, n-1)$?
1) 10 2) 20
3) 5 4) 6

11. Which of the points $P(2, 0)$, $Q(-3, 0)$, $R(0, 4)$ and $S(0, 6)$ do not lie on the x-axis?
1) R only 2) Q and S only
3) R and S only 4) Q, R and S

12. If in a quadrilateral all sides are equal, then it can be:
1) only a parallelogram 2) only a square
3) only a rhombus 4) all three above

13. If a ball of radius 2.2 cm is put into a cylindrical cup full of water of radius 5 cm and height 6 cm, then how much water flows out of the cylindrical cup?
1) 44.6 cm^3 2) 49.5 cm^3
3) 35.7 cm^3 4) 55.9 cm^3

14. The points $(-a, 0)$, $(a, 0)$, $(0, a)$ where $a \in \mathbf{R}$, are the vertices of a
1) right triangle 2) isosceles triangle
3) equilateral triangle 4) scalene triangle

15. For the data 10, 9, 6, 5, 13, 10, 16, 4
1) Mean < Median < Mode 2) Mean < Mode = Median
3) Mean = Mode < Median 4) Mean = Mode = Median

16. If $P(A \cup B) = P(A \cap B)$ for any two events A and B, then

1) $P(A) = P(B)$ 2) $P(A) > P(B)$

3) $P(A) < P(B)$ 4) None of the above

17. The Σ rotation for the sum $1+7+17+31+49+71$ is

1) $\sum_{k=1}^{6}(2k-1)$ 2) $\sum_{k=0}^{6}(2k^2+1)$

3) $\sum_{k=1}^{6}(3k^2-2)$ 4) $\sum_{k=1}^{6}(2k^2-1)$

18. Let C be the midpoint of a line segment AB, D be the midpoint of AC and E be the midpoint of AD. Then which of the following is incorrect?

1) $4AE = BC$ 2) $AE = \frac{1}{8}AB$

3) $AD + DC = 2BC$ 4) $BD = \frac{3}{4}AB$

19. What are the three dimensions along which every object is measured?

1) Volume, Surface, Area 2) Circumference, Diameter, Length

3) Length, Width, Height 4) Area, Circumference, Height

20. If a shopkeeper gives 10% discount on a medicine of MRP ₹ 300 and takes 10% VAT then the final price of the medicine is

1) ₹ 300 2) ₹ 297

3) ₹ 275 4) ₹ 315

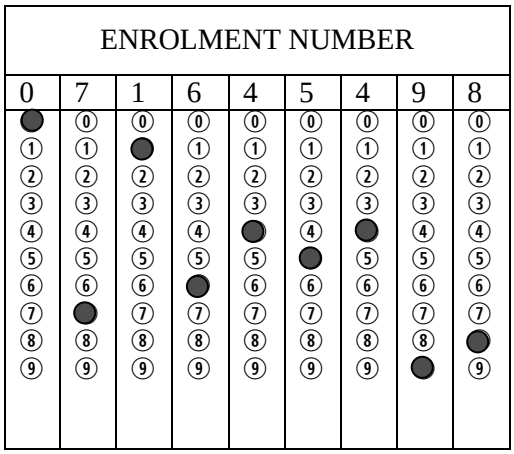
INSTRUCTIONS FOR MARKING
IN THE
OMR RESPONSE SHEET

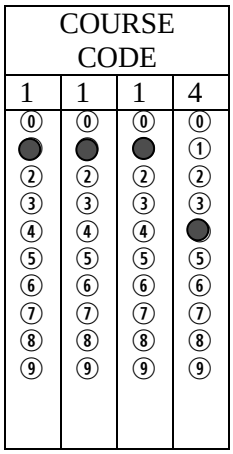
1. Use only H.B. pencil for filling the response sheet

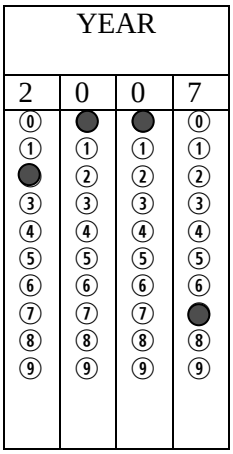
2. Mark your answers in the proper column

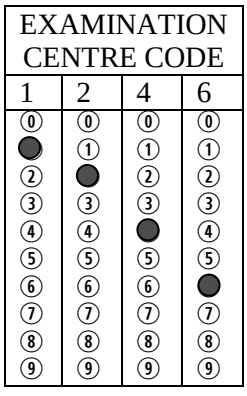
3. Enter your Enrolment no., year, month, course code and examination code in the respective boxes given for that as shown below. For example if your enrolment number is 071645498, then you need to first write the enrolment number as shown in the box titled enrolment no., given below. Then you have to dark each circle corresponding to each digit appearing in the enrolment number. Suppose, for example, the leftmost digit is 0. So we darken the first 0 in the box. Next digit is 7. Then we select the row containing 7 and darken the '7' in the second column. Similarly you can fill the other digits.

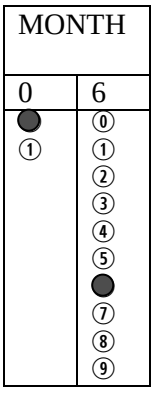
   Note that the **Course Code** you have to fill in the OMR sheet is the **computer code** for this course which is **1114.** This is different from the course code given in the programme guide or blocks for this course.











4. For filling the correct choice for the multiple choice questions, do as illustrated in the following example.

   Suppose Question 13 is as given below:

Q.No. 13.: Which one of the following is **not** an integer.

(1) -1 (2) 0.5

(3) $\sqrt{4}$ (4) 0

Suppose your answer to the question is "0.5" which is given in option no. "2". Then you have to select the column against no. 13 in the boxes given below and write 2 in the box below "13" and shade the circle numbered 2 in that as shown below. If your answer is such that none of the 4 options are correct, then select 0.

1	2	3	4	5
⓪	⓪	⓪	⓪	⓪
①	①	①	①	①
②	②	②	②	②
③	③	③	③	③
④	④	④	④	④

6	7	8	9	10
⓪	⓪	⓪	⓪	⓪
①	①	①	①	①
②	②	②	②	②
③	③	③	③	③
④	④	④	④	④

11	12	13	14	15
		2		
⓪	⓪	⓪	⓪	⓪
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②	②	●	②	②
③	③	③	③	③
④	④	④	④	④

16	17	18	19	20
⓪	⓪	⓪	⓪	⓪
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②	②	②	②	②
③	③	③	③	③
④	④	④	④	④

OMR Response Sheet
(For writing answers to multiple choice questions)

This page is to be torn off and after filling the relevant boxes attach it along with your answers to other questions in the assignment. **This is to be submitted at the study centre for evaluation**.

ENROLMENT NUMBER								
⓪	⓪	⓪	⓪	⓪	⓪	⓪	⓪	⓪
①	①	①	①	①	①	①	①	①
②	②	②	②	②	②	②	②	②
③	③	③	③	③	③	③	③	③
④	④	④	④	④	④	④	④	④
⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧	⑧	⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨	⑨	⑨	⑨	⑨	⑨

COURSE CODE			
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⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥
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YEAR			
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EXAMINATION CENTRE CODE			
⓪	⓪	⓪	⓪
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③	③	③	③
④	④	④	④
⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨

MONTH	
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	⑨

ANSWERS TO MULTIPLE CHOICE QUESTIONS

1	2	3	4	5
⓪	⓪	⓪	⓪	⓪
①	①	①	①	①
②	②	②	②	②
③	③	③	③	③
④	④	④	④	④

6	7	8	9	10
⓪	⓪	⓪	⓪	⓪
①	①	①	①	①
②	②	②	②	②
③	③	③	③	③
④	④	④	④	④

11	12	13	14	15
⓪	⓪	⓪	⓪	⓪
①	①	①	①	①
②	②	②	②	②
③	③	③	③	③
④	④	④	④	④

16	17	18	19	20
⓪	⓪	⓪	⓪	⓪
①	①	①	①	①
②	②	②	②	②
③	③	③	③	③
④	④	④	④	④