OMT-101

ASSIGNMENT BOOKLET

Bachelor's Preparatory Programme

PREPARATORY COURSE IN GENERAL MATHEMATICS

(This assignment is valid only upto: 31st December, 2012
And
Valid for both Jan 2012 cycle and July 2012 cycle)

It is compulsory to submit the assignment before filling in the exam form.

School of Sciences
Indira Gandhi National Open University
Maidan Garhi
New Delhi-110068
(January, 2012 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.

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 could access them by clicking on the links "for student ⟶ download ⟶ assignments ⟶ BPP".)

Instructions for Formatting 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 :……

……

……

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 December 31st, 2012**.

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

We wish you good luck.

Assignment

(To be done **after** studying the course material)

Course Code: OMT-101
Assignment Code: OMT-101/TMA/2012
Maximum Marks: 100

Section A

1. a) Check whether (x – 1) is a factor of the polynomial. $x^4 + x^3 + x^2 - 5x + 2$. Justify your answer. (3)

b) Draw the coordinate axes and represent the following points

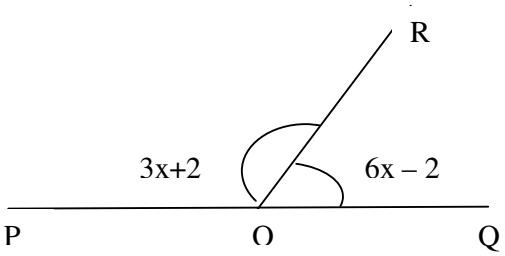
i) $(-1, 4)$ ii) $(1, 2)$

iii) $(5, -2)$ iv) $(-1, -2)$

v) $(3, 0)$ vi) $(0, -5)$ (3)

c) Find the point on the x-axis which is equidistant from (1, 2) and $(-5, -15)$. (4)

2. a) Consider the following figure, what value of x would make POQ a line. (3)



b) Using the result ${}^{n}C_{r} + {}^{n}C_{r-1} = {}^{n+1}C_{r}$

compute i) $20_{C_9} + 20_{C_8}$ and

ii) $15_{C_7} + 15_{C_8}$ (4)

c) Show that $n_{C_0} + n_{C_1} + \cdots + n_{C_n} = 2^n$. (3)

3. a) How many words with or without dictionary meaning can be made from the letters in the word JANUARY, assuming that no letter is repeated, if 4 letters are used at one time? (5)

b) A wire when bent into the form of a square encloses an area of 144 sq.cm. if the wire is bent in the form of a circle, then what would be the area? (5)

4. a) Find the variance and standard deviation for the data

10, 14, 14, 16, 18, 20, 12, 12, 10, 11. (4)

b) For 108 randomly selected college applicants, the following frequency distribution for entrance exam scores was obtained. Construct a histogram, frequency polygon, and o-give for the data .

Class limits	Frequency
90-98	6
99-107	22
108-116	43
117-125	28
126-134	9

Applicants who score above 107 need not enroll in a summer developmental program. In this group, how many students do not have to enroll in the developmental program? (4)

c) Consider the following data have been arranged in ascending order

10, 14, 14, 14, 11, x, 12, 13, 15, 17.

If the mean of the data is 14, find x. (2)

5. a) Find the complement of each of the following events.

i) Rolling a die and getting a 6

ii) Selecting a letter of the alphabet and getting a letter from the set of first 10 alphabets

iii) Selecting a month and getting a month that begins with a A.

iv) Selecting a day of the week and getting a Sunday. (2)

b) In a sample of 50 people, 21 had type O blood, 22 had type A blood, 5 had type B blood, and 2 had type AB blood. Set up a frequency distribution and find the following probabilities:

i) A person has type O blood.

ii) A person has type A or type B blood.

iii) A person has neither type A nor type O blood.

iv) A person does not have type AB blood. (4)

c) Determine which events are mutually exclusive and which are not when a single die is rolled.

i) Getting an odd number and getting an even number

ii) Getting a 3 and getting an odd number

iii) Getting an odd number and getting a number less than 4

iv) Getting a number greater than 4 and getting a number less than 4 (2)

d) Find the mean deviation for the data 10, 7, 8, 3 and 12 (2)

6. a) A shopkeeper gives 15 % discount on a T.V. set. If the list price of the T.V. set is ₹ 16,500, find the amount which a customer has to pay for buying the T.V. set if the rate of sales tax is 10 %. (2)

b) Pardeep buys 1000 shares of par value of ₹10 each of a company which pays annual dividend of 15 % at such a price that he gets 5 % on his investment. Find the market value of a share. (2)

c) Give a counter example to disprove the statement that every counting number is greater than or equal to the sum of the proper factors. (2)

d) Give an example of the following:

i) Two irrational numbers, the product of which is a rational number

ii) One rational number lying between 0 and -1.

iii) A decimal number lying between 0.003 and 0.004.

iv) A fraction lying between $\frac{1}{2}$ and $\frac{3}{4}$. (4)

7. a) Calculate the following:

i) $\sqrt[3]{27} \times \sqrt[3]{81}$

ii) $\left(\frac{1}{25}\right)^{2/3}\left(5^{-1/3}\right)(125)^{1/3}$.. (4)

b) Express 98 as a sum or difference of two numbers whose powers are easier to calculate and then use binomial theorem to compute 98 raised to the power 5. (3)

c) Perform the following operation

i) $p(x)+q(x)$ and $p(x)-q(x)$ where $p(x)=x^3-3x^2-1$ and

$q(x)=2x^4+x^3+x^2-7x.$

ii) $s(u).r(u)$ and where the remainder and quotient on division of $s(u)=\left(u^6+u^4+3u^2+7u-4\right),\ r(u)=u^5+u^6-u^2-u.$ (3)

8. a) List 2 objects that you find around you in each of the category below.
(i) Sphere (ii) Cuboid (iii) Cylinder (3)

b) A circular piece of metal measures radius 7 cm. Find its cost at the rate of ₹ 20 per square cm. (3)

c) A person paid Rs. 200 for a basket of 20 oranges. He found that 4 of them were bad and threw them away. He sold ¼ of the remaining oranges at a profit of 20% and the rest at a loss of 5%. What is his profit or loss? (4)

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. If $\frac{-5}{7} - x = -1$ then x is _____.

   (1) $\frac{-12}{7}$ (2) $\frac{2}{7}$

   (3) $\frac{-1}{5}$ (4) $\frac{-2}{7}$

2. The value of $\left(\frac{-5}{9} \div \frac{2}{3}\right)$ is:

   (1) $\frac{-5}{2}$ (2) $\frac{-5}{6}$

   (3) $\frac{-10}{27}$ (4) $\frac{-6}{5}$

3. The value of $\left[\left(\frac{-4}{3}\right)^{-3}\right]^2$ is:

   (1) $\frac{-3}{4}$ (2) $\frac{3}{4}$

   (3) $\frac{729}{4096}$ (4) $\frac{1024}{243}$

4. In an isosceles triangle, the unequal angle is twice of the equal angles. The measure of an unequal angle is:

   (1) 45° (2) 90°

   (3) 60° (4) 120°

5. Which of the following is not greater than $\frac{-3}{4}$?

   (1) $\frac{-1}{4}$ (2) $\frac{-2}{4}$

   (3) 0 (4) $\frac{-5}{4}$

6. The value of $2x - [3x\{4x - (2x - y)\}]$ is:

   (1) $x - y$ (2) $2x + 2y$

   (3) $x + y$ (4) $x^2 - y^2$

7. If 10% of $8\times80 = y\%$ of 64×80 then y is _____.

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

(3) $\frac{8}{5}$ (4) $\frac{1}{5}$

8. If $\frac{3}{p}=6$ and $\frac{3}{q}=15$ then p – q is _____.

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

(3) $\frac{3}{10}$ (4) $\frac{5}{6}$

9. The value of $\left[7^{-1}-8^{-1}\right]^{-1}-\left[3^{-1}-4^{-1}\right]^{-1}=$_____.

(1) 68 (2) – 44
(3) 44 (4) 56

10. Which one of the following angles is acute?

(1) 45° (2) 90°
(3) 100° (4) 95°

11. If C (n , 12) = C (n , 8) then C (22, n) is:

(1) 231 (2) 210
(3) 252 (4) 303

12. 0! + 1! = _____.

(1) 1 (2) 2
(3) 0 (4) – 1

13 The sum of all odd numbers between 1 and 11 is _____.

(1) 35 (2) 24
(3) 25 4) 36

14. $\left(1+\sqrt{2}\right)\left(1-\sqrt{2}\right)=$ _____.

(1) – 1 (2) 3
(3) 1 (4) 0

15 If $P(A)=\frac{2}{3}$, $P(B)$, $P(A\cap B)=\frac{1}{4}$ then $P(A\cup B)=$_____.

(1) $\frac{31}{36}$ (2) $\frac{7}{36}$

(3) $\frac{11}{36}$ (4) $\frac{35}{36}$

16. $6.87 - (2.49 + 4.056) =$ _____.

(1) 0.224 (2) 0.124
(3) 3.24 (4) 0.324

17. The value of C(6, 2) is :

(1) 30 (2) 15
(3) 12 (4) 8

18. The sum of 28 odd and 5 even numbers will be _____.

(1) an odd no. (2) an even no.
(3) a prime (4) a complex number

19. In 2 hours the minutes hand of a clock rotates through an angle of _____.

(1) 60° (2) 180°
(2) 360° (4) 720°

20. A ladder is standing against a wall 12 mt in height at a distance of 5 m. Length of ladder is _____.

(1) 17 m
(2) 13 m
(3) 13.5 m
(4) 7 m

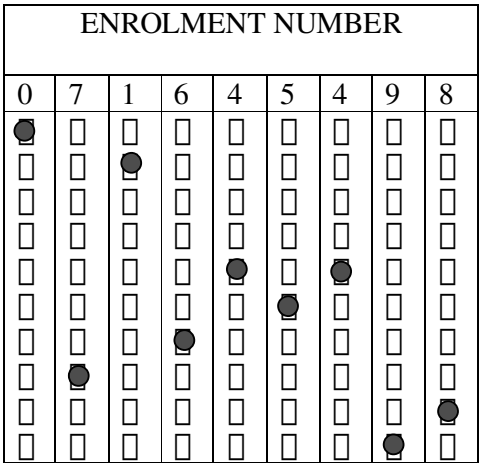
INSTRUCTIONS FOR MARKING
IN THE
OMR RESPONSE SHEET

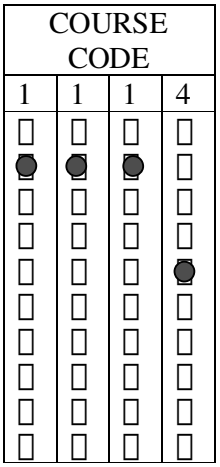
1. Use only H.B. pencil for filling the response sheet

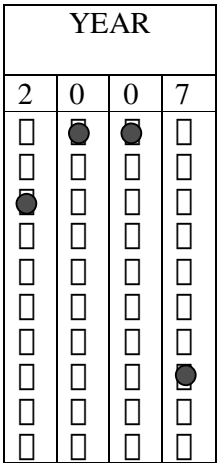
2. Mark your answers in the proper column

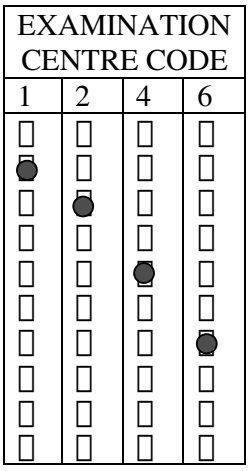
3. Enter your Enrolment no., year, month, course code and examination code in the respective boxes given for that as shown below. For example if your enrolment number is 071645498, then you need to first write the enrolment number as shown in the box titled enrolment no., given below. Then you have to 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.

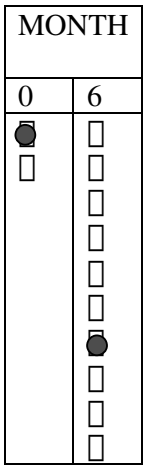
   Note that the **Course Code** you have to fill in the OMR sheet is the **computer code** for this course which is **1114.** This is different from the course code given in the programme guide or blocks for this course.











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 "$\sqrt{4}$" which is given in option no. "3". Then you have to select the column against no. 13 in the boxes given below and write 3 in the box below "13" and shade the circle numbered 3 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
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○

6	7	8	9	10
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○

11	12	13	14	15
○	○	○	○	○
○	○	○	○	○
○	○	●	○	○
○	○	○	○	○
○	○	○	○	○

16	17	18	19	20
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○
○	○	○	○	○

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								

COURSE CODE			

YEAR			

EXAMINATION CENTRE CODE			

MONTH	

ANSWERS TO MULTIPLE CHOICE QUESTIONS

1	2	3	4	5

6	7	8	9	10

11	12	13	14	15

16	17	18	19	20