

# MATHS

Time: 1 hour  
Max Marks: 25

JDMCCI

Note: All questions are compulsory.

Q.1 Attempt any six

6 X 2 = 12

- Find  $Q_2$  for the following data : 100, 99, 98, 97, 58, 69, 70. 97
- Find  $D_4$  for the following data : 40, 41, 39, 38, 35, 36, 30, 45, 46. 38
- Compute  $P_{30}$  for the following data :  
89, 92, 46, 48, 61, 82, 78, 80, 74. 61
- Find  $Q_1$  for the following data : 148, 171, 158, 151, 154, 159, 152, 163, 171, 145,
- Write the conjugates of (a)  $3 + \sqrt{7}i$  (b)  $-23 - i$
- Show that  $(3+2i)(3-2i)$  is a real number. 13
- Evaluate  $i^{56}$ . 1

Q.2 Attempt any three

3 X 3 =

i. Compute  $Q_3$  for the following data

x	350	450	550	650	750
f	16	19	24	28	13

ii. Compute  $D_2$  for the following data. 4

x	2	4	3	5	7	6	8
f	14	20	13	19	13	13	8

- Express  $(1+2i)(-2+i)$  in the form of  $a+bi$ , where  $a$  and  $b$  are real numbers and  $i = \sqrt{-1}$ . -4-3i
- If  $\omega$  is a complex cube root of unity, then show that  $(2 - \omega)(2 - \omega^2) = 7$ .

Q.3 Attempt any one

1 X 4 =

i. Calculate  $Q_1$  for the following data, 270

C.I	0-180	180-360	360-540	540-720	720-900
f	15	20	25	30	10

ii) Express  $\frac{4+3i}{1-i}$  in the form  $a+bi \rightarrow \left(\frac{1}{2} + \frac{7}{2}i\right)$