Total	Printed	Pages	:	4	
-------	---------	-------	---	---	--

Roll No.....

## 11251

## B.Sc. Maths. (Hon.) (1<sup>st</sup> semester) (Regular/Re-Appear/Improvement) Examination, 2022

## Algebra

Paper Code: BHM-111

Time Allowed: 3 Hrs.

[Max Marks: 60]

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after examination.

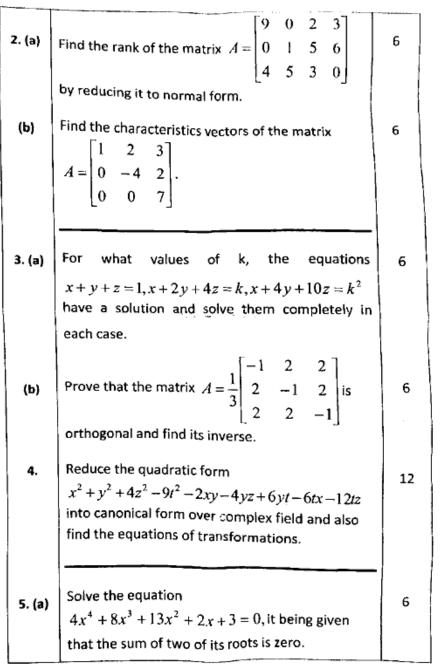
Note: Attempt Five questions in all. Q.No. 9 is Compulsory. All questions carry equal marks.

1. (a)	Solve the following system of equation using matrix method:					6	
(b)	Express $A = \begin{bmatrix} & & & & & & & & & & & & & & & & & &$	1 -2 3 4 d a sk	0 1 2 -4 (cew-s)	5 6 7 -2	3 1 1 0 etric	as the sum of a matrix.	6

M-0331/11251

P.T.O.

https://www.iguonline.com



M-0331/11251

2

(b)	Solve the equation $x^4 - 9x^2 + 4x + 12 = 0$ , given that it has a multiple root.	6
6. (a)	Find the condition that the roots of the cubic $x^3 - px^2 + qx - r = 0$ , may be in H.P. Hence or otherwise solve the equation $6x^3 - 11x^2 + 6x - 1 = 0$ ,	6
(b)	Find the equation of squared differences of the roots of the equation $x^3 - 7x + 6 = 0$ .	6
7. (a)	Show that the roots of the cubic equation $x^{3}-12x+8=0 \text{ are}$ $4\cos\frac{2\pi}{9},4\cos\frac{4\pi}{9},4\cos\frac{8\pi}{9}.$	6
(b)	Solve the bi-quadratic $x^4 - 4x^3 + 9x^2 - 12x + 18 = 0$ by resolving it into quadratic factors.	6
8. (a)	Solve $x^4 - 10x^3 + 35x^2 + 50x + 24 = 0$ by Ferrari's method.	6
(b)	Show that the equation $x^7 + x^4 + 8x + k = 0$ has at least 4 imaginary roots for all values of k.	6
M-0331	1/11251 3	P.T.O.

https://www.iguonline.com

9. (a) If A and B are symmetric matrices, prove that AB 2 is symmetric if and only if AB=BA. (b) Prove that 0 is the latent root of a matrix if and 2 only if A is singular. (c) Prove that transpose of a unitary matrix is 2 unitary. 2 (d) Define rank of a matrix. (e) Find an equation whose one root is 2-3i. 2 (f) State Cayley Hamilton's theorem. 2

\*\*\*\*\*

https://www.iguonline.com Whatsapp @ 9300930012 Send your old paper & get 10/-अपने पुराने पेपर्स भेजे और 10 रुपये पार्ये, Paytm or Google Pay से

M-0331/11251

1