Α	L . 5			April-2	l) (New) Examination	
				Faculty Co Subject Cod		
Tin	1e : 2	2.30	Hours]			Total Marks : 70
1.	М.С	C.Q.				20
	(1)	Но	w many subsets	of $A = \{1, 2, 3\}$	} are possible ?	
		(a)	3	(b)	4	
		(c)	6	(d)	8	
	(2)	A∩	φ =			
		(a)	{ \$ }	(b)	U	
		(c)	{}	(d)	А	
	(3)		two finite sets	A and B if n(A	A) = $n(B)$, then A and	d B are called
		(a)	Null set	(b)	Equivalent set	
		(c)	Unit set	(d)	None	
	(4)	The	e set having only	one subset is	·	
		(a)	Null set	(b)	Unit set	
		(c)	Infinite set	(d)	None	
	(5)	Wh	ich of the follow	ving condition	satisfied in symmetric	e matrix ?
		(a)	A = - A'	(b)	A = 1	
		(c)	A = 0	(d)	$\mathbf{A} = \mathbf{A}^{\mathrm{T}}$	
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- (6) If order of matrix A is 3 × 1 and order of matrix B is 1 × 3, then order of AB is _____.
 - (a) 3×1 (b) 1×3
 - (c) 3×3 (d) 1×1
- (7) Unit matrix is denoted by
 - (a) \cup (b) I (c) 0 (d) None
- (8) If $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ 2 & -1 \end{bmatrix}$, then A + B =_____. (a) $\begin{bmatrix} 3 & 6 \\ 6 & 4 \end{bmatrix}$ (b) $\begin{bmatrix} 3 & 6 \\ 6 & -4 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 0 \\ 2 & 6 \end{bmatrix}$ (d) None

(9) The equation of line passing through origin having slope 3 is

(a) y = 3x + 8(b) y = 8x + 3(c) 3x - y = 0(d) 3x + 3y = 1

(10) For two parallel lines which of the following condition is true?

- (a) $m_1 \cdot m_2 = -1$ (b) $m_1 \cdot m_2 \neq -1$
- (c) $m_1 = m_2$ (d) $m_1 \neq m_2$
- (11) Given vertices are the vertices of an equilateral triangle, it is necessary to show
 - (a) all of its sides are different
 - (b) two of its sides are equal
 - (c) all of its sides are equal
 - (d) none

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(12) The slope of the line passing through the points (2, 2) & (4, 6) is

	(a) 4	(b) 3	
	(c) 2	(d) None	
(13)	$11^{\circ}a = 1, l = 9, \text{ then } S_{12} =$	*	
	(a) 60	(b) !4	
	(v) 25	(d) 70	
(1-1)	The common ratio of a G.P. 1	2. 6. 18. 54 is	
	(a) 3	(b) $\frac{1}{3}$	
	(c) 2	(d) 4	
(15)	The common difference o	f an A.P. 50, 45, 40, 35	15
	,		
	(a) 5	(b) 5	
	(c) $\frac{1}{5}$	(d) 0.5	
(16) If $a = r = 2$, the fourth term of	of a sequence is	
	(a) 12	(b) 16	
	(c) 8	(d) 2	
(17) The mean of the observation	ns	
	3. 2. 10, 4. 1 is		
	(a) 20	(b) 5	
	(c) 15	(d) 4	
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(18) The median of 15, 25, 5, 3, 40 is _

(a)	5	(b) 25
(c)	4	(d) 15

(19) The mode of the 2, 5, 3, 9, 3, 4, 2, 3, 1, 3 is

(a)	3	(b) 2
(c)	1	(d) 9

(20) Quartiles are the values dividing a given set of observation into

(a)	two equal parts	(b)	four equal parts
(c)	six equal parts	(d)	none

2. (a) Answer any three :

- (1) Explain method of representation of set.
- (2) Define with example Infinite set, Subset.
- (3) Write power set of the set $A = \{x, y, z\}$.
- (4) If $n_1 = 85$, $n_2 = 60$, $n_3 = 55$, $\overline{x}_1 = 38$, $\overline{x}_2 = 40$, $\overline{x}_3 = 42$, find combined mean.

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(5) Calculate Q_2 from the following data :

4, 24, 15, 35, 55, 45

(6) Find K if points (-3, 8), (K, 5) and (-5, 2) will be collinear.

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(b) Any three :

- The A.M. of 150 items is found to be 25. Later on it was found that two items were wrongly taken as 32, 50 instead of 82, 80. Find correct mean.
- (2) The median of following distribution is 32. Find missing frequency.

Marks :	0-10	10-20	20-30	30-40	40 - 50
No. of					
students :	5	8	-	6	3

- (3) Find a point which divides the line joining (2, 8) and (6, 14) externally in the ratio 5 : 3.
- (4) If A = {a, b}, B = {2, 3}, C = {3, 4}, find A × (B \cap C) & A × (B \cup C).
- (5) Define union of sets with example and write properties of union.
- (6) If U = {a, b, c, 1, 2, 3}, A = {a, 1, 2}, B = {a, b, 3} verify $(A \cup B)' = A' \cap B'$.

(c) Any two:

- (1) Prove : $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- (2) Prove that (3, 2), (5, 4), (3, 6), (1, 4) are the vertices of a square.
- (3) Find the equation of line passing through the point (-3, 1) & perpendicular to the line 5x 2y + 7 = 0.
- (4) Find Median :

Class :	0 - 20	20-40	40 - 60	60 - 80	80 - 100	100 - 120
Frequency :	10	20	30	50	40	30

(5) Find Mean :

Class :	10 - 18	18 - 30	30 - 40	44 – 54	54 - 80	80-110
Frequency :	15	28	36	18	10	8

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3. (a) Any three :

- (1) Define diagonal matrix, square matrix.
- (2) Define with example :
 - (i) Arithmetic progression
 - (ii) Geometric progression
- (3) If A = $\begin{bmatrix} 5 & 3 \end{bmatrix}$, B = $\begin{bmatrix} 3 \\ 0 \end{bmatrix}$ find AB and BA.
- (4) Find distance between the points A (4, -1) & B (7, 3).
- (5) The 100th term of an A.P. is 505 and common difference is 5 find its first term.
- (6) Find sum of first 20 terms of an A.P.

15, 18, 21

(b) Any three :

- (1) Which term will be $\frac{1}{1536}$ in a G.P. $\frac{1}{3}$, $\frac{1}{6}$, $\frac{1}{12}$?
- (2) The fourth and seventh terms of a GP are 72 and 576 respectively. Find its first term.

(3) If $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & -1 & 0 \\ -2 & 3 & 5 \end{bmatrix}$ find A + A'

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- (4) The 4th term of an A.P. is 19 and its 12th term is 51. Find its 21st term.
- (5) Prove that the line passing through the points (1, 7) & (3, 11) is parallel to the line passing through the points (3, 4) & (0, -2).

(6) If
$$A = \begin{bmatrix} 4 & 1 \\ 2 & 3 \end{bmatrix}$$
 find matrix B such that $A + 2B = A^2$.

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- (c) Any two:
 - (1) If S_1 , S_2 , S_3 are respectively sum of n, 2n, 3n terms of an AP. Prove that $S_3 = 3 (S_2 - S_1)$.
 - (2) Three numbers are in AP, their sum and product are 15 and 105. Find the number.

(3) If
$$A = \begin{bmatrix} -4 & -3 & -3 \\ 1 & 0 & 1 \\ 4 & 4 & 3 \end{bmatrix}$$
 prove that adj $A = A$.
(4) If $A = \begin{bmatrix} 1 & 3 & 2 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$ find Inverse of A.
(5) If $A = \begin{bmatrix} 1 & 1 & -1 \\ 2 & -3 & 4 \\ 3 & -2 & 3 \end{bmatrix} B = \begin{bmatrix} -1 & -2 & -1 \\ 6 & 12 & 6 \\ 5 & 10 & 5 \end{bmatrix}$

Find AB & identify the matrix.

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