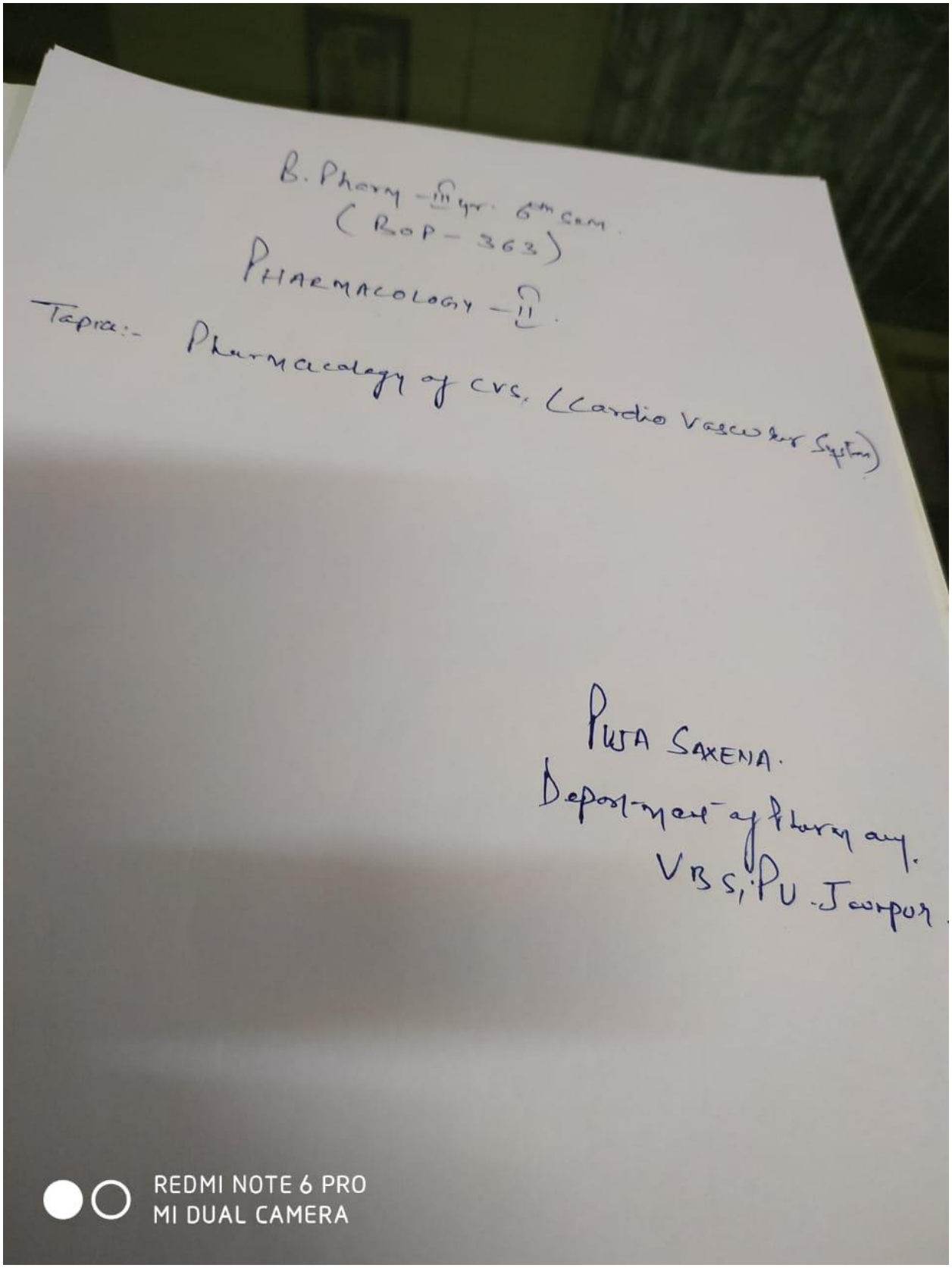

B. Pharm – III yr. 6th sem.
(RoP – 363)
PHARMACOLOGY – II
Topic:- Pharmacology of CVS. (Cardio Vascular System)
PUJA SAXENA.
Department of Pharmacy.
VBS, PU. Jaunpur.
REDMI NOTE 6 PRO
MI DUAL CAMERA

UNIT-① Pharmacology-II ①

CARDIAC GLYCOSIDES

These are glycosidic drugs having cardiac inotropic property. They ↑ myocardial contractility and output in a hypodynamic heart without increase a ↑ in O_2 consumption. Thus myocardial efficiency ↑.

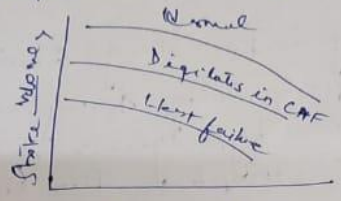
Cardiac glycosides & their Source :-

Source	Glycosides
1) Digitalis purpurea (Leaf)	Digitoxin, Gitoxin.
2) Digitalis lanata (Leaf)	Digitoxin, Digoxin
3) Strophanthus kombe (Seed)	Strophanthin K.
4) Strophanthus gratus (Seed)	Strophanthin-G.
5) Convallaria majalis	Convallatoxin
6) Bufo Vulgaris	Bufotoxin
7) Semi synthetic	Acetyl-digoxin Acetyl. Strophanthidin

Pharmacological Actions

1) Heart :- Digitalis has direct effect on myocardial contractility & electrophysiological properties. In addition it has Vagomimetic action, reflex effects due to alteration in haemodynamic & direct CNS effect affect Sympathetic activity

(1) causes a dose dependent ↑ in force of contraction of heart in a positive inotropic action.



Relationship b/w pumping ventricular resistance & cardiac output in normal & failing heart. Action of digitalis on failing heart.

Mechanism of Action:

Digitalis ↑ the force of cardiac contraction by a direct action independent of innervation. It selectively binds to extracellular part of the membrane associated $Na^+ K^+$ ATPase of myocardial fibres and inhibits this enzyme. Inhibition of this cation pump results in progressive accumulation of Na^+ intracellularly. This indirectly results in intracellular Ca^{2+} accumulation.

(2) Blood Vessels:- (1) Had mild direct vasoconstrictor action

(2) Has no prominent effect on BP Systolic may ↑ & diastolic may fall in CHF Patients.

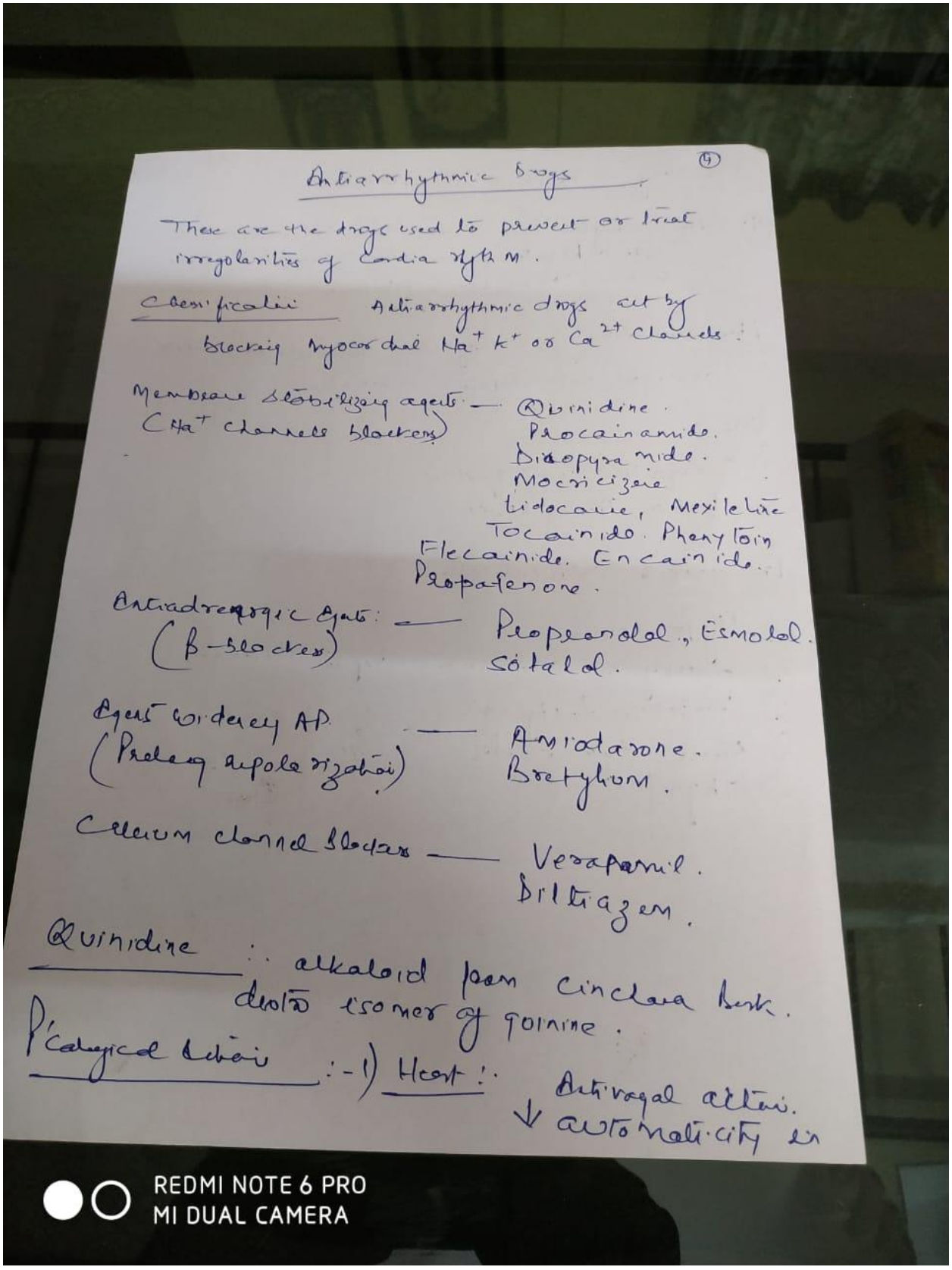
(3) Kidney :- Diuretics in CHF patients. (3)

(4) CNS :- Higher doses cause CTZ activation.
Severe higher doses causes Nausea, Confusion, Vomiting, Visual disturbances.

Pharmacokinetics :- Digitoxin Metabolized in liver & undergoes enterohepatic circulation.

Uses :-
1) Congestive heart failure.
2) Cardiac Arrhythmias.

Precautions & Contraindications
1) Hypokalemia.
2) elderly, renal or severe hepatic disease.
3) Ventricular tachycardia.
4) Acute Myocarditis
5) Thyrotoxicosis



④

Antiarrhythmic drugs

These are the drugs used to prevent or treat irregularities of cardiac rhythm.

Classification — Antiarrhythmic drugs act by blocking myocardial Na^+ K^+ or Ca^{2+} channels.

Membrane stabilizing agents — (Na^+ channels blockers)
- Quinidine.
- Procainamide.
- Disopyramide.
- Mocricizine
- Lidocaine, Mexiletine
- Tocainide. Phenytoin
- Flecainide. Encainide.
- Propafenone.

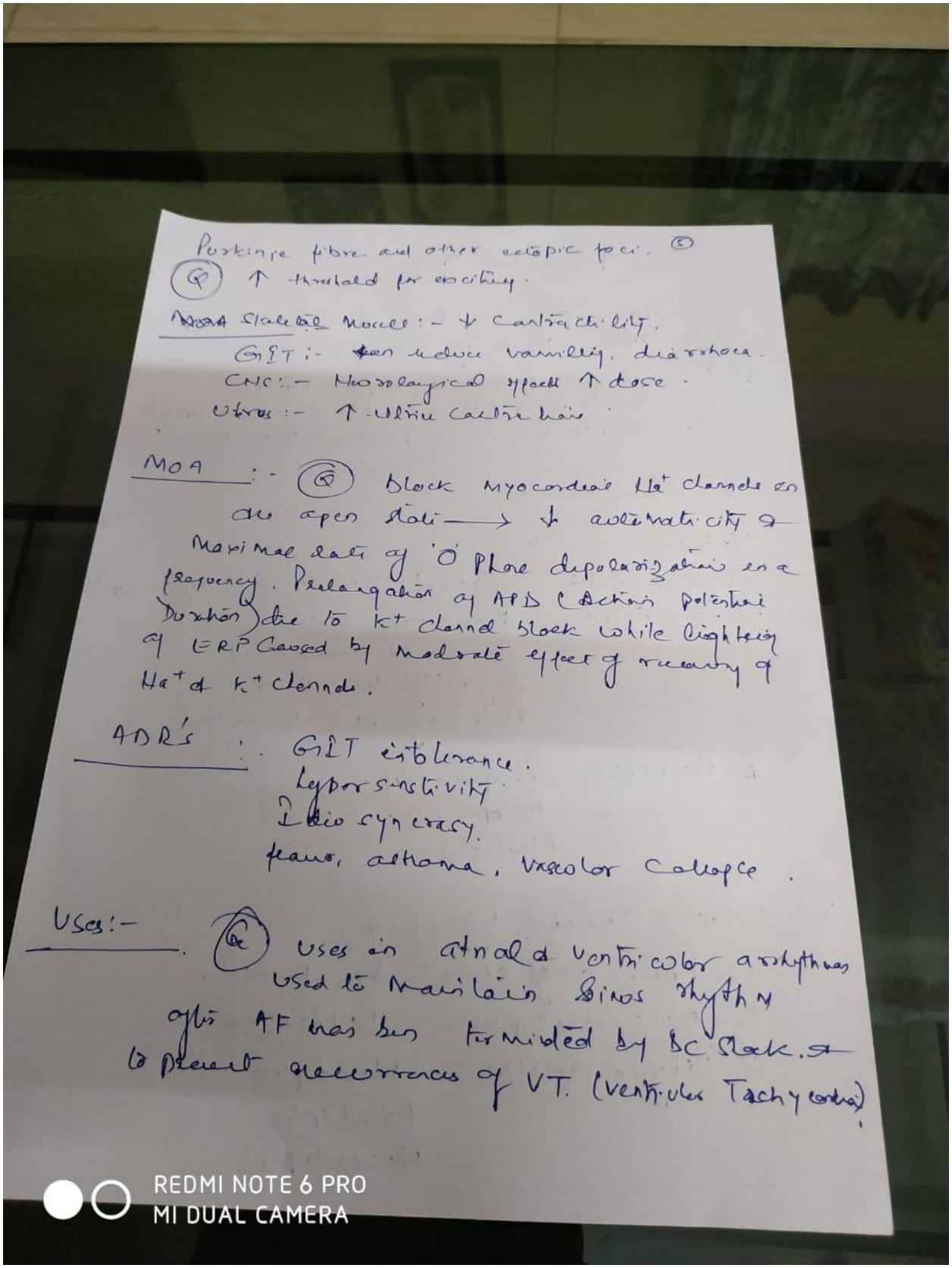
Antiadrenergic agents — (β-blockers)
- Propranolol, Esmolol.
- Sotalol.

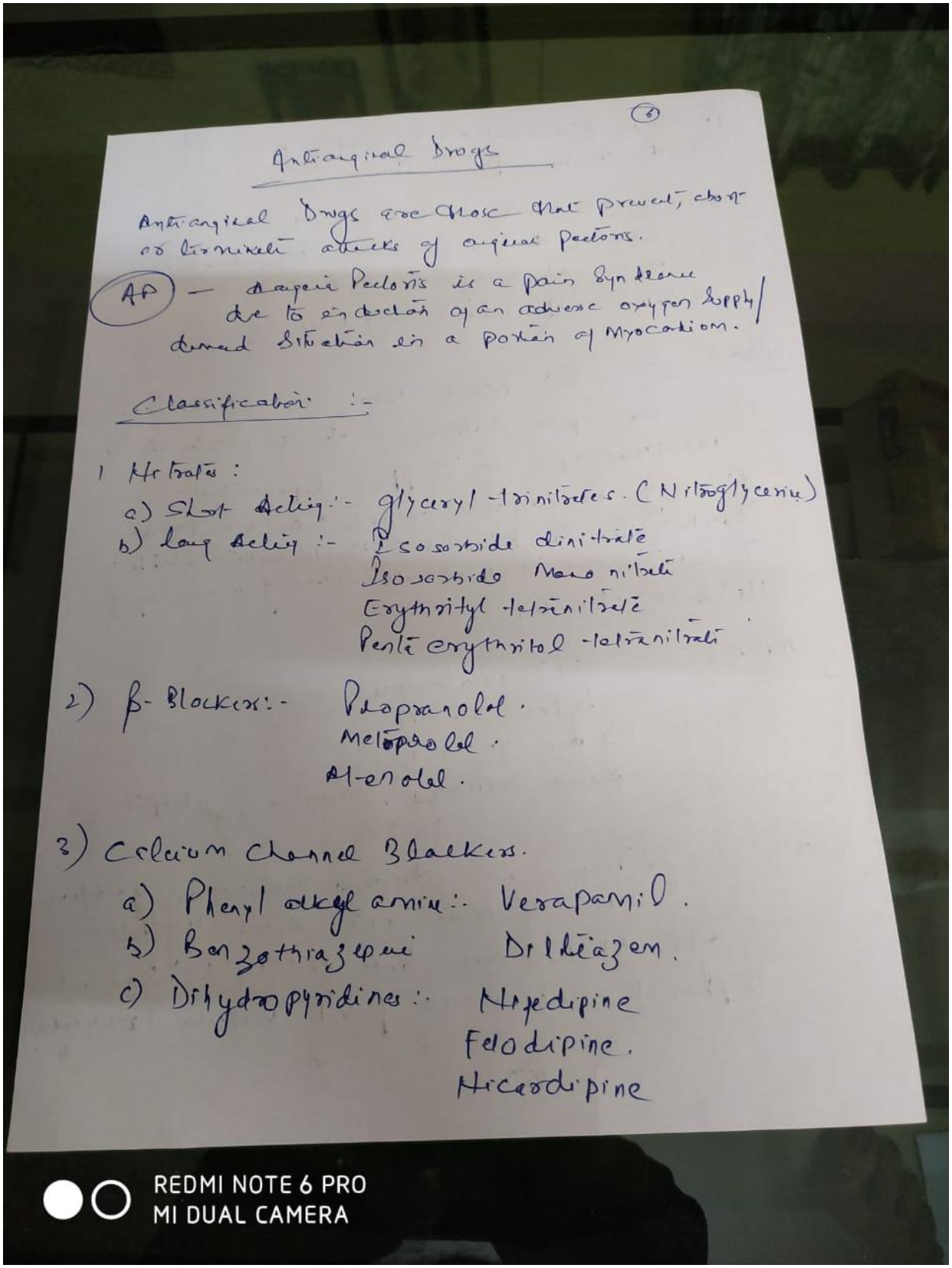
Agents with decay AP — (Prolong repolarization)
- Amiodarone.
- Bretylium.

Calcium channel blockers —
- Verapamil.
- Diltiazem.

Quinidine: alkaloid from cinchona bark. dextro isomer of quinine.

Physiological effects: -1) Heart: Antivagal action. ↓ automaticity in





(6)

Antianginal Drugs

Antianginal Drugs are those that prevent, abort or terminate attacks of anginal pectoris.

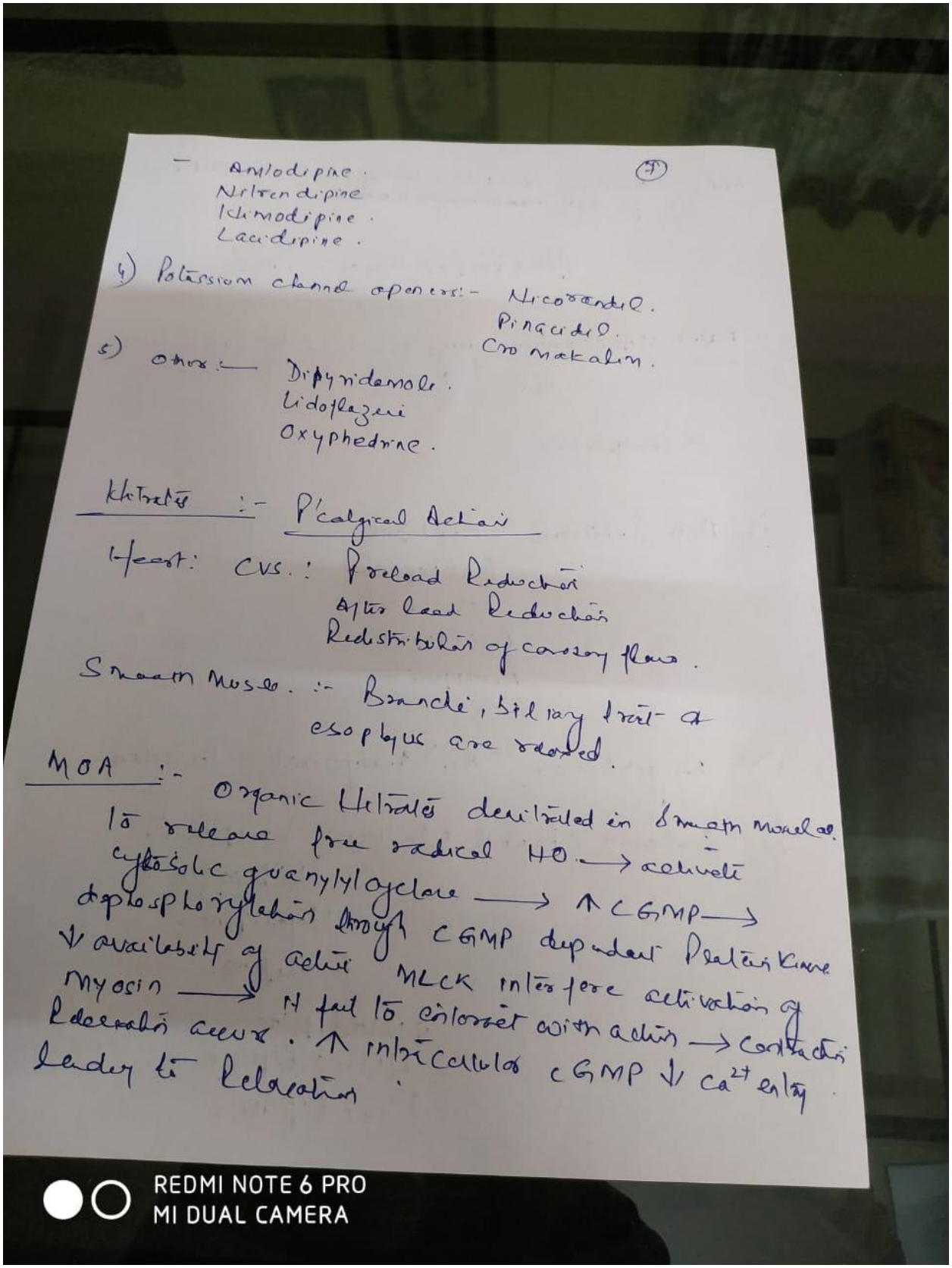
(AP) – Angina Pectoris is a pain syndrome due to reduction of an adverse oxygen supply/demand situation in a portion of Myocardium.

Classification :-

1 Nitrates :
- a) Short Acting :- glyceryl trinitrates. (Nitroglycerin)
- b) long Acting :- Isosorbide dinitrate
  Isosorbide Mono nitrate
  Erythrityl tetranitrate
  Penta erythritol tetranitrate

2) β-Blockers :- Propranolol.
Metoprolol.
Atenolol.

3) Calcium Channel Blockers.
- a) Phenyl alkyl amine :- Verapamil.
- b) Benzothiazepine Diltiazem.
- c) Dihydropyridines :- Nifedipine
  Felodipine.
  Nicardipine



- Amlodipine.
- Nitrendipine
- Isradipine.
- Lacidipine.

4) Potassium channel openers:- Nicorandil.
Pinacidil.
Cromakalim.

5) others:- Dipyridamole.
Lidoflazine
Oxyphedrine.

Nitrates :- Pharmacological Action

Heart: CVS: Preload Reduction
After load Reduction
Redistribution of coronary flow.

Smooth Muscle :- Bronchi, biliary tract & esophagus are relaxed.

MOA :- Organic Nitrates decomposed in smooth muscle to release free radical NO → activate cytosolic guanylyl cyclase → ↑ cGMP → dephosphorylation through cGMP dependent Protein Kinase ↓ availability of active MLCK interfere activation of myosin → ↓ fail to interact with actin → Contraction Decrease occur. ↑ intracellular cGMP ↓ Ca^{2+} entry leads to Relaxation.

ADP's : Throbbing headache, flushing, dizziness, palpitation, fainting, ~~methemoglobinemia~~

ANTIHYPERTENSIVE DRUGS

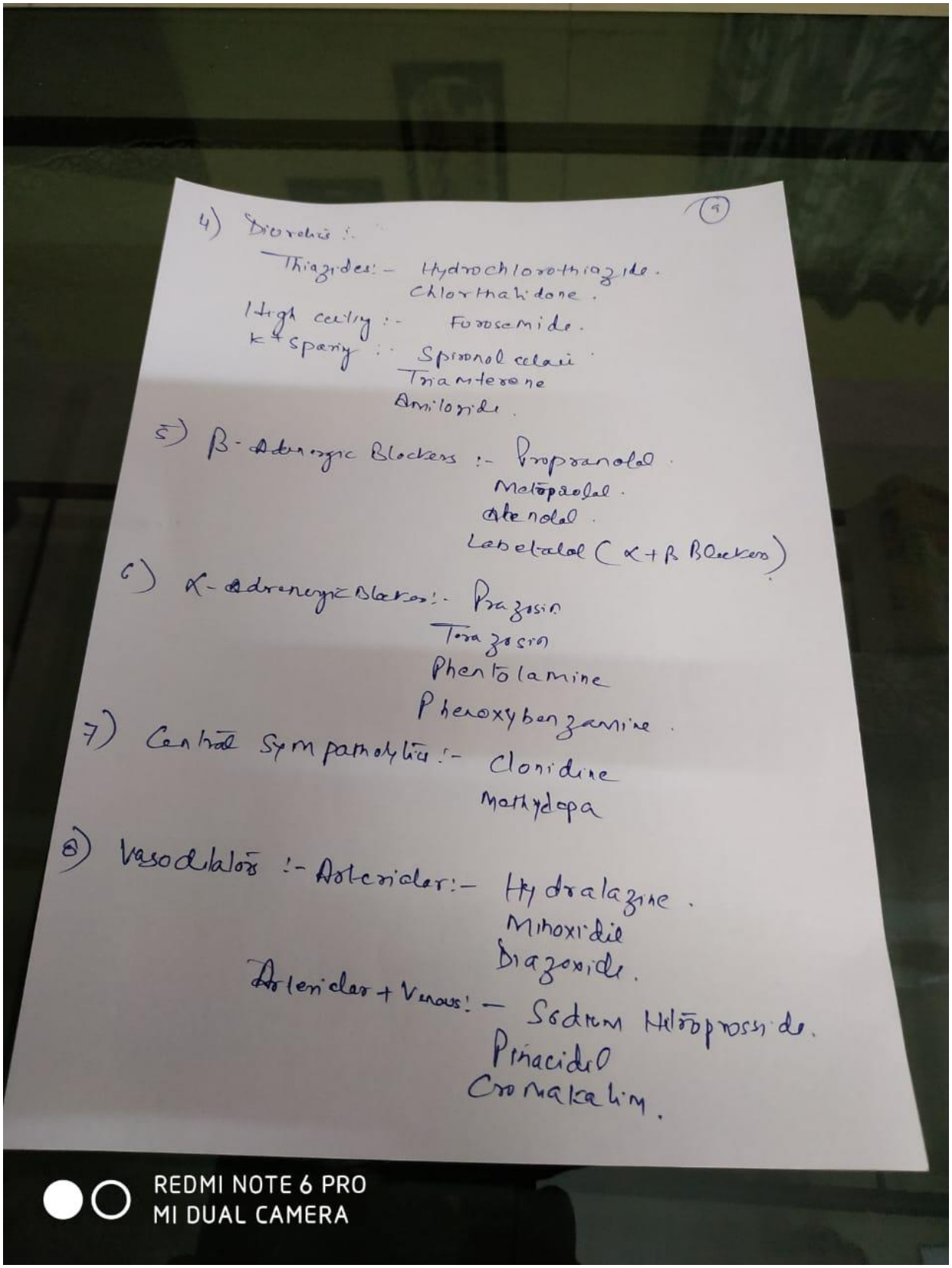
ANTI-HYPERTENSIVES Drugs are used to lower down B.P.

Classification :-

1) ACE Inhibitors :- Captopril.
Enalapril.
Lisinopril.
Perindopril.
Ramipril.

2) Angiotensin (AT1) antagonist :- Losartan

3) Calcium channel Blockers :- Verapamil.
Diltiazem
Nyedipine.
Felodipine
Amlodipine
Hitrendipine
Lacidipine.


4) Diuretics :-
Thiazides :- Hydrochlorothiazide.
Chlorthalidone.
High ceiling :- Furosemide.
K+ Sparing :- Spironolactone
Triamterene
Amiloride.
5) β-Adrenergic Blockers :- Propranolol.
Metoprolol.
Atenolol.
Labetalol (α+β Blockers)
6) α-Adrenergic Blockers :- Prazosin
Terazosin
Phentolamine
Phenoxybenzamine.
7) Central Sympatholytics :- Clonidine
Methyldopa
8) Vasodilators :- Arteriolar :- Hydralazine.
Minoxidil
Diazoxide.
Arteriolar + Venous :- Sodium Nitroprusside.
Pinacidil
Cromakalim.
REDMI NOTE 6 PRO
MI DUAL CAMERA