QUESTION BANK (VETERINARY PHARMACOLOGY)

PAPER NO. 17

Drugs acting on cardio vascular system

1.Name the following:

1. Active metabolite of nitroprusside which induce vasodilatation.-(Nitrous oxide)

2 .A glycoside used to reduce capillary bleeding.-(Rutin)

3. A synthetic penta saccharide used as an invivo anticoagulant.-(fondaparinux / idraparinux)

4. An anticoagulant of fungal origin.-(Coumarin)

5. Antidote of fibrinolysin -(epsilon amino caprolic acid)

6 .A recombinant hirudin –(lepirudin, bivalirudin)

7.Bipyridine compound having cardio active action.—(Amrinone, Milrinone)

8.Benzodiazepine derivative class IV antiarrhythmic drug having calcium channel blocking action.-(Diltiazem)

9.Dextro isomer of antimalarial drug quinine.-(Quinidine)

10.Most powerful presser agent.-(Angiotensin II)

11.Natural source of Hirudin.—(Leech, *Hirudo medicinalis*)

12.One non diuretic thiazide used for inducing vasodilatation.-(Diazoxide)

13.One specific AT 1 antagonist- (Losartan)

14.One specific AT 2 antagonist.-(PD 123177)

15.One dye having anti-heparin activity.-(Tolonium chloride)

16.One phospholipid helps in coagulation.-(Cephalin)

17.One mineral which helps in coagulation .-(Calcium)

18.One synthetic heparin antagonist.—(hexadimethrine bromide)

19.One synthetic anticoagulant which reduce prothrombin synthesis.-(coumarins)

20.Pyridazone derivative having cardio active action.-(Pimobendan)

21.Peptide hormone secreted by liver which regulate iron metabolism.-(hepcidin)

22.The vasodilators used in coronary disease.- (nitrites, theophylline, papavarine, propronolol, nicotinic acid, verapamil.

23.The drug of choice for ventricular arrhythmia in digitalis toxicity .-(Lidocaine)

24.Three in-vitro anticoagulant- (sod. fluoride, sod. EDTA ,Sod.citrate)

25.The most potent natural anticoagulant .—(Hirudin)

26.The most potent natural inhibitor of thrombin .—(Hirudin)

27.Three topical haemostatic.-(absorbable gelatin, oxidized cellulose, fibrin foam)

28.Three styptic –(ferric chloride, Alum, Tannins)

29.Three haematinics .-(Iron, Cobalt, Copper, Zinc, Folic acid)

30.Three peripheral vasodilators—(sodium nitropruside, nitroglycerine, isosorbide dinitrate)

31.Two anticoagulant mixture used for blood collection .-(ACD- acid citrate dextrose, CPD-citrate phosphate dextrose)

32.Two blood substitutes.-(Oxyglobin, hemopure)

33.Two inhibitors of plasminogen.-(aminocaproic acid, tranexamic acid)

34.Two direct inhibitors of coagulation factor X a.-(Rivaroxaban/ apixaban)

35.Two direct inhibitors of coagulation factor II.-(hirudin/ bivalirudin)

36.Two tissue plasminogen activators.-(reteplase/ alteplase)

37.Two inorganic nitrites used in clinical practice.-(sodium nitrite, Bismuth sub nitrite)

38.Two bipyridine derivative with powerful inotropic effect .-(amrinone, milrinone)

39.Two prominent glycoside obtained *from Strophanthus gratus* seed .—(Strophanthidin, Ouabain)

40.White blood cells in which heparin is stored.-(Basophil)

II.Fill up the blanks with most appropriate words:

1.About 65 to 70 % of the total body iron is present in …….-(haemoglobin)

2.Amrinone increase the myocardial .....by inhibiting phospho diesterase III.-(cAMP)

3.Among animals ……..species is highly susceptible to iron deficiency.-(pigs)

4.Approximately …….percent of filtered sodium and water is reabsorbed from the proximal convoluted tubule.-(65%)

5.Benazepril is converted in to its active compound……by the liver.-(benazeprilat)

6.Cobalt deficiency mainly affect young growing ruminants and it is more severe in ……than in cattle .-(Sheep)

7.Copper preparations based on ……is used for depot preparation.-(methionine, heptonate)

8.Cobalt is necessary for the synthesis of ……..vitamin.-(B12)

9.Commercially B12 is obtained as a bye-product of …….manufacturing unit.-(antibiotic)

10.Coagulated estrogen increase ……and prothrombin activity ,used to control post operative bleeding.-(AC globulin)

11.Digitalis lanata gives .....glycoside.—(digoxin)

12.Digitalis glycosides causes accumulation of .....ions intracellularly.-(sodium)

13.Digitalis is primarily metabolised by .....to digoxin.-(Liver)

14.Digitalis glycoside is obtained from the plant named.....—(*Digitalis purpurea*)

15.Digitalis glycoside inhibits the enzyme .....in the myocardial fibres and causes accumulation of .....intra cellularly.-(Na+ K+ ATPase, Na+)

16.Epinephrine ……..dilution can be used as local spray to reduce bleeding.-(1:10000 to 1:20000)

17.Extracts of adrenal medulla, and pituitary causes ……..in blood pressure.-(increase)

18.Ergotamine tartrate cause …….of blood vessels.-(constriction)

19.Five-HT is released in allergic reactions in rabbits, mouse, rats, and ruminants but not in …….-(man)

20.Fibrinolysin will interfere with the action of ……..and there by inhibit clotting.-(thrombin)

21.Heparin is most abundantly seen in ……and liver.-(Lung)

22.Nitroglycerine is metabolized to ……..which indirectly mediate vasodilation.—(nitric oxide)

23.Nitric oxide activate ……to produce cyclic GMP.—(guanyl cyclase)

24.Phenytoin sodium primarily an ……..drug is having antiarrhythmic action also.-(antiepileptic/anticonvulsant)

25.Propranolol is a .....blocker this effect is clinically utilised in the treatment of cardiac arrhythmia.-(Beta)

26.Quinidine is an isomer of ..... an anti malarial drug.-(Quinine)

27.Quinidine is obtained from the plant ……..._(cinchona bark)

28.Reserpine is an alkaloid obtained from .....and it is useful to reduce the blood pressure.—*(Rauwalfia serpintina*)

29.Russels viper venom convert prothrombin to …….and promote clotting.-(thrombin)

30.Sodium algenate is an absorbable haemoststic obtained from ……(source).-(sea weeds)

31.Sodium algenate is sprayed locally for the control of bleeding along with 2% solution of…….-(calcium chloride)

32.Sodium citrate in very small quantity enhance the Production..... in bone marrow and stimulate clotting .-(platelet)

33.Sodium fluoride / oxalate causes precipitation of …… and thereby prevent clotting.-(calcium)

34.Sodium fluoride is added to blood at the rate of ……..to prevent clotting.-(2 mg/ml)

35.Sodium EDTA will prevent clotting of blood by …….with calcium --(Chelation)

36.Sodium EDTA is added at a rate of ……mg/ml of blood to prevent clotting.-(one)

37.Spoiled sweet clover contain the toxic principle…….which is having anti coagulant action.-(dicoumarol)

38.Sodium citrate is an .....in vitro /-(anticoagulant)

39.Strophanthin –G is otherwise known as…….-(Ouabain)

40.The drug of choice for ventricular arrhythmia in digitalis intoxication is .....-(Lidocaine)

41.The active compound of enalapril is ……..(enalaprilat)

42.The lethal outcome of digitalis toxicity is due to cardiac .....-(arrhythmias)

43.The source of digitoxin is .....-(*Digitalis purpurea*)

44.The toxic principle *of Thevetia nerifolia* is .....-(Thevetin)

45.Thromboplastin convert …….to thrombin (prothrombin)

46.The source of digitalis is .....and of thevetine is.....-(*Digitalis purpurea , Thevetia nerifolia*)

47.The normal blood volume is about ……% of the body weight.-(8%)

48.The first ACE inhibitor introduced in therapy is .....which is an SH containing dipeptide. (Captopril)

49.The main transducer mechanism of AT1 receptor is .....in vascular smooth muscle.-(C-IP 3)

50.Verapamil is used in cardiac .....because of its prolonged AV node ERP.-(arrhythmia)

51.....is a competitive antagonist and inverse agonist of Angiotensin II and it is 1000 times more selective for AT1 than AT2.-(Losartan).....

52…….venom clots blood even in absence of calcium.-(viper.)

53…….is an endogenous glycoprotein hormone that regulate erythropoiesis.-(erythropoietin)

54…….percent of filtered sodium is reabsorbed from thick portion of the ascending limb of loop of Henle.-(up to 25%)

III.State True or False

1.Absorbable gelatin can be used as a topical haemostatic .-(T)
2.Amrinone inhibits phosphodiesterase III.—(T)

3.A part of digitalis induced decreased in heart rate and slowing of AV conduction can be blocked with atropine.-(T)

4.Apixaban is a new anticoagulant with antithrombotic action.—(T)

5.As a plasma volume expander a colloid solution must be used in combination with a crystalloid solution to replenish the interstitial and ICF deficit.-(T)

6.Amrinone shows inotropic as well as vasodilator effect.-(T)

7.Amiodarone is an iodinated benzofuran with antiarrhythmic effect by prolong duration of action potential and effective refractory period of heart muscle.-(T)

8.Amiodarone is a class III antiarrhythmic agent possessing action of class I and II also.-(T)

9.Aminocaproic acid inhibits the action of urokinase and arrest bleeding .-(T)

10.Amyl nitrate can be administered orally for treatment purpose.-(F)

11.Amyl nitrate is a volatile liquid.-(T)

12.Aminocaproic acid is related to lysine and it blocks activation of plasminogen to plasmin and inhibit fibrinolysis.-(T)

13.Ancestim is a recombinant methionyl human stem cell factor.-(T)

14.Angiotensin. II is the most powerful pressar agent , 40 times more pressar than epinephrine.-(T)

15.Angiotensin.III stimulate aldosterone secretion.-(T)

16. Application of ice crystals locally can reduced bleeding.-(T)

17.Basic substances can be used as heparin antidote.-(T)

18.Blood added with sodium EDTA will remain un clotted for several days.-(T)

19.Blood added with sodium citrate is not suitable for studying size and shape of RBC .-(T)

20.Benazepril is an ACE Inhibitor used in animal practice.-(T)

21.Calcium channel blockers like amlodipine have vasodilation effects and drug of choice for systemic arterial hyper tension in cats.-(T)

22.Carbonic anhydrase inhibitors are contra indicated in the presence of liver disease because they may precipitate hepatic coma.-(T)

23.Captopril is an ACE inhibitor ,prevent the conversion of Angiotensin I to active Angiotensin II.(T)

24.Cobra venom contain protease which destroy fibrinogen resulting in un clotting of blood.-(T)

25.Coumarins do not have any action on circulating prothrombin level.-(T)

26.Calcium is synergestic with digoxin on heart.-(T)

27.Classic antiarrhythmic drugs are the most potent sodium channel blockers.-(T)

28.Class IV antiarrhythmic drugs interfere with slow voltage sensitive calcium channels.-(T)

29.Carboprost can be used to control post partum haemorrhage that is not controlled by oxytocin.-(T)

30.Deficiency of gastric acid impairs iron absorption as the reduction of ferric to ferrous iron will be less.-(T)

31.Dabigatran is a direct inhibitor of the thrombin.—(T)

32.Delayed blood transfusion reactions usually occurs with in 7-10 days after transfusion and it include delayed haemolysis and jaundice.-(T)

33.Dronedarone is less toxic than Amiodarone.-(T)

34.Desmopressin is a synthetic analog of vasopressin.-(T)

35.Dextrose prolong the action of heparin.-(T)

36.Dextro rotatory form of warfarin is more active than the others.-(F)

37.Dextran is a complex poly saccharide molecule obtained by the action of bacteria on sucrose.-(T)

38.Dicoumarol on injection will act in 2 days and act for three days.-(T)

39.DMSO and its metabolites dimethyl sulfide traps free radical such as superoxide and produce anti-inflammatory effect.—(T)

40.Dimethyl sulfoxide (DMSO) prepared as 10 % solution in 5% dextrose is used to treat oedema in horse.-(T)

41.Digitalis in small dose enhance the excitability of atria and ventricle .-(T)

42.Digitalis in large amount enhance the excitability of atria and ventricle.-(F)

43.Digoxin is a powerful inotropic agent with antiarrhythmic effect.-(T)

44.Digoxin is contra indicated in hypertropic cardiomyopathy.-(T)

45.Diltiazem is a calcium channel blocker without any first pass metabolic effect.-(T)

46.Dopamine stimulate beta and alpha receptors at higher dose.-(T)

47.Dobutamine an analog of dopamine stimulate beta 1 receptors but has only weak action on beta 2 and alpha receptors.—(T)

48.Digitalis therapy may cause “White vision”.-(T)

49.Digitalis slows the heart rate by action mediated through vagus nerve.-(F)

50.Digitalis reduces the size of failing heart because it increases the contractile power.-(T)

51.EDTA will not prevent the clotting of blood.-(T)

52.EDTA is a very powerful in-vitro anticoagulant.-(F)

53.EDTA disodium salt is a very powerful in-vitro anticoagulant.(T)

54.Effect of coumarin is seen only after 48 hours of administration.-(T)

55.Enalapril is an approved ACE inhibitor for veterinary use in CHF management.-(T)

56.Enalapril is an angiotensin converting enzyme inhibitor.—(T)

57.Endoperoxidase PG (G2 and H2) converted to thromboxane A2 a potent platelet aggregating compound.-(T)

58.Erythrocytes of avian and reptiles species have nucleus and have a long life span.-(T)

59.Even in liver damaged patients sodium acetate can be used as a systemic alkaliniser.-(T)

60.Excess potassium antagonise arrhythmogenic activity of digitalis.-(T)

61.Ferrous salts are better absorbed than ferric salt.-(T)

62.Ferrous gluconate and ferrous succinate are haematinic.-(T)

63.Ferrous gluconate is more irritant on GI tract than ferrous sulphate.-(F)

64.Ferrous sulphate is more irritant than ferrous gluconate on GI tract.-(T)

65.Ferrous salts are better absorbed when it is combined with B –complex.-(T)

66.For proper utilization of Iron Copper is very essential.-(T)

67.Furosemide increases the calcium excretion in the urine.-(T)

68.Furosemide should not be used as monotherapy for chronic heart failure management.-(T)

69.For the treatment of recurrent calcium oxalate uroliths in dogs with hypercalcuria hydrochlorothiazide is recommended.-(T)

70.Following drugs can be used as arteriolar dilators- Potassium channel openers like Nicorandil, Calcium channel blockers like Nifedepine, Hydralazine.—(T)

71.CPDA(citrate, phosphate, dextrose, adenine) solution is added to blood at a rate of 100ml/ 100 ml of blood for blood transfusion..-(F)

72.Fatal agranulocytosis is a side effect of procainamide.-(T)

73.5 HT is seen in mast cells of rats , mice, hamster .-(T)

74.5HT is seen in Argentaffin cells of G.I Tract.-(T)

75.Five-HT is a transmitter substance in the CNS .-(T)

76.Gelatin sponge can be used internally also to control minor bleeding.-(T)

77.Glyceryl trinitrate is inactivated by lungs.-(T)

78.Glyceryl trinitrate is an explosive liquid.-(T)

79.Glyceryl trinitrate(Nitroglycerine) , an organic nitrate with vascular relaxation is a flammable and explosive liquid.-(T)

80.Glyceryl trinitrate relaxes vascular smooth muscles primarily on the venous side.-(T)

81.Headache is one of the side effects of nitrites.-(T)

82.Heparin is complexed with histamine in mast cells.-(T)

83.Heparin is well absorbed from the G.I.tract and is active orally.-(F)

84.High concentration of methylene blue convert haemoglobin to meth haemoglobin.-(T)

85.Hirudin is a direct thrombin inhibitor.-(T)

86.Hydrophobic surface prevent blood clotting.-(T)

87.Haemostatics are agents which arrest bleeding by involvement in clotting mechanism.-(T)

88.Hyaluronidate sodium is synthesized primarily by the type-B synoviocytes in synovial membrane.-(T)

89.Heparin can be used as an anticoagulant in blood banks for collection and preservation of blood.-(F)

90.High dosage of lipid emulsion injections can cause immune-suppression.-(T)

91.Heta starch will give a plasma volume expansion for 24 to 36 hours.-(T)

92.Heta starch 6% , a plasma volume expander is a synthetic glucose polymer.-(T)

93.In rats heparin is most abundantly seen in liver.-(F)

94.Increase potassium inhibits binding of cardiac glycoside to the Na+ K+ pump and vice versa.-(T)

95.Immediately after the application of DMSO on the skin breath will have an unpleasant odor.—(T)

96.In heparinised blood WBC disappears in 2 hours.-(T)

97.Increase potassium inhibits binding of cardiac glycoside to the Na+ K+ pump and vice versa.-(T)

98.If iron dextran preparations are administered via i/m route more than 90% is available for immediate use.-(F)

99.It is best to treat chloride responsive alkalosis by solution containing sodium chloride and potassium chloride since affected animals usually have potassium deficit.-(T)

100.It is difficult to over-alkalinize the body using an indirect agent in a patient with normal renal function.-(T)

101.Lower concentration of methylene blue convert met haemoglobin to haemoglobin.-(T)

102.LSD is a partial agonist and antagonist of serotonin.-(T)

103.Lisinopril is not a pro drug and as such is active.-(T)

104.Low dose of aspirin is more effective than high dose in reducing the platelet aggregation.-(T)

105.Lung oedema can cause metabolic acidosis.-(T)

106.Mammalian erythrocytes can not produce new enzymes.-(T)

107.Methaemoglobinemia is one of the side effect of nitrites.-(T)’

108.Molgramostin is recombinant human granulocyte macrophage colony stimulating factor which is an immune stimulant.-(T)

109.Moxonidine , a vasodilator is a selective agonist at the imidazoline receptor subtype-1 in medulla involved in the control of sympathetic tone.-(T)

110.Nicergoline is an ergot alkaloid with vasodilator action.-(T)

111.Nitrites dilate post capillary vessels and reduce venous return.—(T)

112.Nitrites readily oxidizes haemoglobin to methaemoglobin and hypoxia can results.-(T)

113.Nitrites are physiological antagonist of nor epinephrine on blood vessels.-(T)

114.Nitroglycerine is having first pass hepatic metabolism.-(T)

115.Nitroglycerine and isosorbide dinitrate act mainly on venous blood vessels and dilate –(T)

116.One of the source of digoxin is *Digitalis lanata*.-(T)

117.Omeprazole increases the bioavailability of digoxin.-(T)

118.Oprelvekin is a recombinant interleukin eleven (IL -11) functions as a thrombopoietic growth factor resulting in increased platelet production.-(T)

119.Ouabain is the most potent of the three glycoside.-(T)

120.Oxyglobin is a blood substiute , it is an ultrapurified polymerised bovine haemoglobin in a modified lactate ringer solution.-(T)

121.Oxypolygelatin (5%) can be used as a plasma volume expander.—(T)

122.Oxidized cellulose is specially treated surgical gauze that promote clotting.-(T)

123.Oxidized cellulose should not be used in combination with thrombin because low pH interfere with the activity of thrombin.-(T)

124.Oxidized cellulose as a surface dressing will interfere with epithelization.-(T)

125.Oxidized cellulose interfere with bone regeneration.-(T)

126.Oxidized cellulose can be used along with thrombin for the control of bleeding.-(F)

127.Oxalic acid in small amount is a coagulant because it antagonize antithrombin.-(T)

128.Oxyglobin is a blood substiute , it is an ultrapurified polymerised bovine haemoglobin in a modified lactate ringer solution.-(T)

129.Pimobendan isa non sympathomimetic , non glycoside inotropic drug that also has vasodilating properties.-(T)

130.Pegfilgrastim is a pegylated granulocyte colony stimulating factor stimulate bone marrow to produce more neutrophil.-(T)

131.Pimobendan is having inotropic and vasodilator action.-(T)

133.132.Plasminogen can be inhibited by episilon amino caproic acd, calcium, anti plasmin.-(T)

134.Protamin is obtained from sperm of salmon fish, it will bind with heparin to block the anticoagulant action.-(T)

135.Prostacyclines (PGI 2) inhibit platelet aggregation.-(T)

136.Protamine sulphate is a heparin antagonist.-(T)

137.Quinidine is an anti arrhythmic agent.-(T)

138.Rats liver does not have any mast cells and there is no heparin.—(T)

139.Ramipril is a prodrug converted to ramiprilat which inhibits ACE.-(T)

140.Respiratory regulation of acid base balance is faster than renal regulation.-(T)

141.Rivaroxaban is an anticoagulant with anti thrombotic action.—(T)

142.Russels viper venom clots even haemophilic blood.-(T)

143.Since acidotic animals usually have potassium deficit ,supplement of alkalinizing agent with potassium containing solution is recommended.-(T)

144.Sodium citrate causes un clotting of blood by binding with calcium.-(T)

145.Sodium citrate, as an anticoagulant it may affect the size and shape of RBC.-(T)

146.Saralasin is an octapeptide blocks angiotensin – II receptors.-(T)

147.Sodium citrate is a coagulant in vitro.-(F)

148.Sodium citrate is a coagulant in-vivo.—(T)

149.Sodium EDTA calcium complex remain soluble but no longer a free ion.-(T)

150.Since sodium fluoride calcium complex in blood remain soluble can be used for calcium estimation in serum.-(F)

151.Sodium citrate can be used to prevent clotting of blood for transfusion.-(T)

152.Sodium EDTA will not prevent clotting of blood .—(F)

153.Spoiled sweet clover contains coumarins.—(T)

154. Sodium lactate is metabolized to bicarbonate mainly by the liver.—(T)

155.Sodium nitroprusside is a potent dilator of both arteriolar and venous smooth muscle.-(T)

156.Spironolactone is the drug of choice in chloride resistant alkaloisis.-(T)

157.Spironolactone causes decrease in potassium loss.-(T)

158.Spironolactone decreases digoxin clearance.-(T)

159.Styptics will arrest bleeding by precipitating the blood proteins.-(T)

160.Since acidotic animals usually have potassium deficit ,supplement of alkalinizing agent with potassium containing solution is recommended.-(T)

161.Ten percent of the filtered sodium is reabsorbed from distal convoluted tubule.-(T)

162.Teprotide is a nonapeptide competitively inhibit angiotensin converting enzyme.-(T)

163.Teprotide prevent the conversion of Angiotensin II to Angiotensin I.-(T)

164.Thiazides increases the calcium excretion.-(F)

165.Thiazides increases the calcium absorption.-(T)

166.Triamterene and amiloride are examples for potassium sparing diuretics.-(T)

167.Thiazides inhibits the conversion of pro -insulin to insulin .-(T)

168.Theophylline dilate coronary blood vessels.-(T)

169.Thiazides induce hyperglycemia and glycosuria in diabetes patients.-(T)

170.The automaticity and conduction in atrial and ventricular muscle is reduced by therapeutic dose of digitalis.-(T)

171.The inotropic effect of digitalis can be prevented by reserpine , an endogenous catecholamine depleter.-(F)

172.The inotropic effect of digitalis can be blocked by Beta adrenergic blockers like propranolol.-(F)

173.The primary use of carbonic anhydrase inhibitors is for reducing the rate of aqueous humor in the treatment of glaucoma.-(T)

174.The overdose of streptokinase can be treated with aminocaproic acid.-(T)

175.The inotropic effect of digitalis is dependent on catecholamine liberation.-(F)

176.To prevent the formation of thrombi and emboli heparin can be injected.-(T)

177.The commercial source of thromboplastin is brain or lung tissue.-(T)

178.The positive inotropic effect of digoxin results from increased calcium availability to contractile protein.—(T)

179.Theophylline dilate coronary blood vessels.-(T)

180.Thromboplastin promote conversion of prothrombin to thrombin.-(T)

181.Thromboplastin can be used as a spray or direct application in a sponge to control bleeding.-(T)

182.Topical anticoagulant provide only mechanical matrix that facilitate clotting.-(T)

183.Tranexamic acid is an anticoagulant with antithrombotic action.—(T)

184.Thrombin is generally used for the fixation of skin transplants.-(T)

185.Thrombin is available in powder form for topical application.-(T)

186.Topical anticoagulants are only effective in controlling oozing of blood from minute vessels and not from veins and arteries.-(T)

187.Unfractionated heparin has greater bio availability and longer half life than low molecular weight heparin.-(F)

188.Vasodilators like hydralazine can improve cardiac output and reduce oedema in CHF.-(T)

189.Vascular endothelium contain heparin.-(T)

190.Vitamin C in the diet increase iron absorption partly by reducing ferric to ferrous form.-(T)

191. Verapamil is a calcium channel blocker undergone first pass hepatic metabolism .-(T)

192.Vitamin K is a competitive inhibitor of dicoumarol.-(T)

193.Viper venom causes intravascular clotting.-(T)

194.Vitamin K is an anticoagulant factor .-(F)

195.Warfarin act in 12 hours and continue for 5-6 days.-(T)

196."White vision" is a toxic sign of digitalis toxicity.-(T)

197.Xanthenes are useful in coronary disease as they produce coronary vasodilatation.-(T)

198.CPD (citrate, phosphate, dextrose) solution is added to blood at a rate of 15ml/100 ml of blood for transfusion.-(T)

IV Choose the correct answers from the given ones :

1.All the following drugs predisposes the individual to digoxin toxicity , except a) use of loading dose b) hypokalemia c) renal disease d) cholestyramine -(d)

2.Angiotensin receptor blocker a) verapamil b) losartan c) captopril d) labetolol -(b)

3.An adrenergic neuron blocking drug with anti arrhythmic effect a) bretylium b) reserpine c) guanethidine d) nicotine.-(a)

4.An antiarrhythmic drug having potassium channel blocking activity is a) amiodarone b) lignocaine c) procainamide d) propranolol .-(a)

5.Aglycon can be released from the cardiac glycosides by a) acid hydrolysis b) enzymatic hydrolysis c) both a and b d) none of the above.-(c)

6.Aldosterone influences the volume of urine a) influences the potassium level in saliva b) influences the HCO3 in urine c) influences the sodium level in the intestinal secretion d) all the above—(a)

7.Acetazolamide is a sulfonamide derivative a) it inhibits carbonic anhydrase b) inhibits epileptic seizures c) reduce cerebrospinal fluid pressure d) all the above.-(d)

8.Acidic urine will influence the excretion of Amphetamine. a) it increase the excretion b) it decrease the excretion c) no change d) amphetamine is not excreted in urine.—(a)

9.Antagonist of adrenaline on heart and peripheral resistance : a) propranolol b) phenoxy benzamine c) phentolamine d) salbutamol. –(a)

10. An important anti angina drug is a) amyl nitrate b) sodium nitrite c) terbutalin d) none of the. above –(a)

11. As a pressar agent a) nor epinephrine is more powerful than angiotensin II b) angiotensin II is more powerful than nor epinephrine c) both are similar d) epinephrine is more powerful than Angiotensin.—(b)

12. As an anti arrhythmic agent following drugs can be recommended a) Quinidine from cinchona b) Calcium channel blocker c) B1 antagonist d) all the above --(d)

13. Aspirin acts as anticoagulant by a) inhibits calcium in coagulation process b) it destroy platelets c) it inactivates COX d) all the above –(c)

14 .Bicarbonate can be recommended in a) hyper ventilation b) uncontrolled diabetes c) ethacrynic acid toxicity d) all the above,--(b)

15.Bioassay of digitalis preparation as per USP has to be done in a) Rat b) Rabbit c)Pigeons d)Turkeys.-(c)

16.Blockade of cardiac beta receptors results in a)bradycardia b) tachycardia c)hypertension d) no effect (a)

17.Commonly used in vivo systemic anticoagulant is a) warfarin b) pindone c) coumarin d) heparin --(d)

18.Cardiomyopathy may accompany myelosuppression and gastroenteritis in dogs treated with one of the following drugs. a) mercaptopurine b) vincristine c) doxorubicin d) actinomycin -D.-(c)

19.Digitalis cause a) negative chronotropic effect b) decreased automaticity c) A.V.node depression d) positive ionotropic effect.—e) all are correct.—e)

20.Digoxin should not be used in the following conditions. a)ventricular fibrillation b)heart block other than CHF c) circulatory shock d)renal and hepatic failure e) all the above—(e)

21.Dicoumarol can be used in a) coronary thrombosis b) thrombophlebitis c) frost bite d) all the above.-(d)

22.Digitalis is primarily metabolized to digoxin by the a) Liver b) Kidney c) Lung d) Muscle --(a)

23.Digoxin is having a) positive inotropic effect b) anti arrhythmic effect c) both A and B—(c)

24.Digitalis therapy may cause a) white vision b) blue vision c) long vision d)none of the above—(a)

25.Dobutamine is used in cardiac affection a) it is a B2 agonist b) it is a B1 agonist c) It is a Beta and alpha agonist d) none of the above.—(b)

26.Ephedrine produce vasoconstriction by a) stimulation of sympathetic ganglia b) stimulation of peripheral adrenergic nerve endings c) direct action on blood vessels d) tachyphylaxis.—(b)

27.Five hydroxyl tryptamine is a) mostly seen in argentaffin cells b) mast cells c) release in allergic reaction d) all the above .—(d)

28.Following drugs can be used as coagulants a) oxidised cellulose b) gelatin sponge c) fibrin foam d) all the above --(d)

29.Following drugs have inotropic effect on heart a) theophylline b) potassium c) magnesium d) all the above ---(a)

30.Following drugs increases the digoxin serum concentration a) Quinidine b) verapamil c) amiodarone d) diltiazem e) all the above.-(e)

31.Following factors predispose to digoxin toxicity a) hypokalemia b) renal dysfunction c) hypercalcemia d) hypernatremia e) all the above.—(e)

32.Following drugs can be recommended as styptic a) vitamine K b) ferric sulphate c) magnesium sulphate d) none of the above --(b)

33.Five hydroxyl tyramine a) causes transmission of peripheral nerve impulse b) release in allergic reaction c) mostly seen in Argentaffin cells of GI tract d) all the above.—(c)

34.For coronary disease the following vasodilators are recommended a) papaverine b) nitrites c) propranolol d) all the above --(d)

35.For testing the renal clearance the following substance is used a) inulin b) dextran c) glucose d) none of the above --(a)

36.For bioassay of digitalis preparation as per USP we have to use a) Rats b) Rabbits c) Pigeons d) Turkeys --(c)

37.For estimation of glucose one of the following anticoagulant is preferred a) sodium citrate b) disodium EDTA c) sodium Fluoride d) all the above -(c)

38.For preservation of blood the following anticoagulant is preferred a) Heparin b) sodium citrate c) sodium fluoride d) none of the above --(b)

39.Ferric chloride is used for the control of bleeding a) externally b) internally c) both internally and externally d) not at all used.-(a)

40.Gitalin is a glycoside present in a) *Digitalis purpurea* seed b) *Strophanthus kombe* leaf c) both d) none of the above.-(d)

41.High concentration of methylene blue convert a) haemoglobin to met haemoglobin b) met haemoglobin to haemoglobin c) no action on haemoglobin d) systemic anti viral action.-(a)

42.Hypotension can be brought about by a) ganglion blocking drugs b) sympathetic blocking drugs c) cortical depressants d) all the above.-(d)

43.In hypertrophic cardiomyopathy the goal of the treatment is to slow the heart rate to improve filling time , this can be achieved by a) calcium blockers b) beta adrenergic blockers c) angiotensin converting enzyme inhibitor d) all the above.—(d)

44.Most potent cardiac glycoside a) digitoxin b) ouabain c) gitoxin d) gitalin -(b)

45. Nitrites can be recommended in a) angina pectoris b) hypertension c) bronchial asthma d) biliary and uterine spasm e) in cyanide poisoning f) all the above.—(f)

46.Nitrites relaxes the smooth muscles a) direct action on smooth muscles of blood vessels b) no action on vessels with arteriosclerotic changes c) conversion of met.haemoglobin to haemoglobin d) all the above .—(a)

47.One of the following is a specific B1 blocker a) salbutamol b) metoprolol c) terbutalin d) none of the above .—(b)

48.Papaverine a) dilate coronary vessels b) relax bile ducts and uterus c) relax bronchi and intestine d) all the above.-(d)

49.Plasma can be stored under frozen condition with out any deterioration for not more than a) two years b) ten days c) six months d) one year .—(a)

50.Quinidine an anti arrhythmic agent shares the following action a) antimalarial b) antipyretic c) oxytocic d) all the above .—(d)

51.Quinidine, primarily an anti arrhythmic agent, shares following action a) antimalarial b) anti pyretic c) oxytocic d) all the above.-(d)

52.Renin is released by a) G.I.tract b) normal kidney c) ischemic kidney d) none of the above.-(c)

53.Rennin is secreted by a by a) G.I.tract b) normal kidney c) ischemic kidney d) none of the above.-(a)

54.Serotonin a) act as a neurotransmitter b) as a precursor of melatonin in pineal glands-regulate biological clock and maintain circadian rhythm c) Initiate vasoconstrictor phase of migraine hypertension. d) all the above. –(d)

55.Sodium citrate is an anticoagulant a) in-vitro b) in-vivo c) both d) no anticoagulant action.—(a)

56.Some of the angiotensin converting enzyme inhibitors are a) captopril b) PD 123177 c) pargylin d) all the above.—(a)

57.Sympathetic vasomotor activity can be inhibited by a) rauwolfia b)mecamylamine c) bretylium .d) none of the above.—(a)

58.Sodium citrate acts as anticoagulant by a)inactivating heparin b) inhibiting the synthesis of prothrombin c)preventing platelets aggregation d) preventing calcium availability.-(d)

59.TCD solution consist of a) trisodium citrate b) citric acid c) dextrose d)all the above.-(d)

60.The anticoagulant factor present in spoiled sweet clover is a) vitamin K b) dicoumerol c) fluoride d) none of the above –(b)

61.The antiarrhythmic agent which act by blocking Beta adrenergic receptors belongs to

a) class I b) class II c) class III d) class IV.-(b)

62.The disadvantages of sodium bicarbonate as an alkalinizing solution a) it has short shelf of 2 years in solution , cloudy solution should be discarded b) it can not be autoclaved, heat split this in to sodium carbonate, carbondioxide and water. c) oral dosing decreases gastric acidity-interfere with digestion d) all the above.—(d)

63.The following drugs are vasodilators a) Nitrites b) glyceryl trinitrite c) Isosorbide dinitrate d) all the above. –(d)

64.The calcium estimation in plasma is interfered with a) EDTA b) sod. fluoride c) sod. citrate d) none of the above.—(b)

65.The drug of choice for ventricular arrhythmia in digitalis toxicity is a) procaine b) lidocaine c) xylocaine d) none of the above.—(b)

66.The following drugs have vasodilator action. a)sodium nitrite b)sodium citrate c) sodium acid phosphate d)all the above.-(a)

67.The glycoside present in urgina martima is a) scillaren A b)pro scillaridine A c) gitoxin d) none of the above.-(b)

68.The pharmacological activity of a cardiac glycoside resides in : a) sugar b) genin c) both d) none.-(b)

69.The following drugs are having vasodilator action a) sodium nitrite b) amyl nitrite c) nitroglycerine d) all the above –(d)

70.The positive ionotropic effect of digitalis is a) depended on the liberation of catecholamine b) not depended on the liberation of catecholamine c)depended on the release of magnesium d) none of the above.—(b)

71.The richest natural source of heparin is a) Lungs b) Liver c) Kidney d) Blood-(a)

72.The glycoside present in *Urgina martima* is a) Scillaren A b) proscillaridin A c) gitoxin d) none of the above.-(b)

73.When parenteral route is recommended for digitalis administration prefer a) s/c b) i/v c) i/m d) none of the above.-(b)

74.The vagal component of cardiac glycoside action is attributed to a) direct stimulation of vagal centers in the brain b) sensitisation of carotid sinus baroreceptors to blood pressure c) enhancement at the myocardial level of pacemaker response to acetyl choline d) all the above.-(d)

75.Vasodilatation can be brought about by a) suppression of vasomotor centre b) blocking of sympathetic ganglia c) blocking of adrenergic neurons d) all the above .—(d)

76.Vasoconstriction can be brought about by a) by stimulation of vasomotor centre in medulla eg.caffeine.b) Stimulation of sympathetic ganglia eg. nicotine. c) stimulation of peripheral

adrenergic nerve endings eg. Ephedrine. d) direct action on smooth muscles of arteriols eg. vasopressin. e) all the above. –(e)

77.Vasoconstrictors can be used in shock due to a) peripheral circulatory failure b) nasal decongestant c) haemostatic on mucous membrane and skin d) All the above.-(d)

78.Which of the following is the most rapidly acting cardiac glycoside?a) digitoxin b) digoxin c) lanatoside C d) ouabain.

79.When digitalis is administered parenterally the route preferred is a)subcutaneous b)intravenous c) intra muscular d) none of the above.-(b)

Choose the correct answer and tell why and why not other answers:

1.Purely venous vasodilator would be most useful in treating which of the following condition? .A) Chronic , stable dilated cardiomyopathy B) Aortic regurgitation from endocarditis C) Cardiac tamponade with ascitis D) Mitral regurgitation with acute pulmonary edema E) Pulmonic stenosis with syncope.

The answer is D .cases of acute ,fulminant cardiogenic pulmonary oedema are most likely to benefit from preload reduction with a venodilator in general , a mixed or arteriolar vasodilator is of more benefit in most other cases and would be of benefit here too. Preload reduction would be harmful in cardiac tamponade.

2. A middle –aged cat is diagnosed with HCM (hypertropic cardio myopathy). Which of the following drugs would be most effective for treating the diastolic dysfunction caused by this disease? A) Furosemide B) Lidocaine C) digoxin D) Hydralazine E) Diltiazem.

The answer is E. Treatment of diastolic dysfunction centers on slowing heart rate, decreasing myocardial oxygen consumption, and enhancing relaxation. Hydralazine can contribute to increased heart rate and possibly worsen any outflow obstruction. Digoxin can also do the latter by increasing contractility and increases oxygen consumption. Furosemide and captopril may be indicated but would not address the diastolic abnormality.

3. All of the following angiotensin converting enzyme inhibitors are excreted mainly by the kidney, EXCEPT: A) Captopril B) Enalapril C) Lisinopril D) Benazepril.

The answer is D. Benazepril has approximately equal biliary and renal excretion.

4. Which of the following statements regarding hydralazine is True? A) Hydralazine acts to dilate both arteriols and veins. B) Hydralazine directly dilate arteriolar smooth muscle. C) Vasodilation is more pronounced in skeletal muscle and skin with hydralazine. D) Hypotension and reflex tachycardia are uncommon side effects. E) Hydralazine dampens the neurohumoral compensatory response in heart failure.

The answer isB.hydralazineis a direct arteriolar dilator. Vasodilation is more pronounced in cerebral, coronary, and splanchnic circulations. Hypotension and reflex tachycardia are common side effects. Enhancementof the neurohumoral response is thought to occur.

5. In general , digoxin would be indicated for a dog with A) dilated cardiomyopathy and atrial fibrillation. B) heart worm disease C) pericardial effusion D) hypertrophic cardiomyopathy E) constrictive pericarditis.

The answer is A. Digoxin is more often used in the treatment of myocardial failure, especially when atrial fibrillation exists. Other diseases listed do not have systolic dysfunction.

6. A dog is being given oral digoxin for heart failure. Which of the following would yield the best absorption? A) use of tablet forms B) use of the elixir form C) giving the drug with food D) concurrent kaolin- pectin use E) concurrent antacid use.

The answer is B. Absorption is better with the elixir than the tablet form. The other factors listed decrease the absorption.

7. The mechanism of action of digoxins positive inotropic effect is A) direct stimulation of the Na+-Ca2+ exchanger. B) competitive inhibition of Na+ , K+ -ATPase. C) activation of Gs protein. D) peripheral and central sympathetic stimulation .E) inhibition of phosphodiesterase activity.

The answer is B.digoxin inhibits Na+, K+ - ATPase at the myocardial cell membrane which allows Na+ to build up inside the cell ;this enhances its exchange with extracellular Ca2+ . the resulting increase in intracellular Ca2+Leads to a positive inotropice ffect.

8. Regarding pimobendan , all the following are true, except: A) Elimination in dog is primarily via hepatic metabolism. B) there is an active metabolite C) the drug is often called an inodilator D) the drug has phosphodiesterase III inhibiting effects. E) the drug substantially increase myocardial oxygen requirement while increasing contractility.

The answer is E. The drug sensitizes the contractile filaments to calcium ion, so can increase contractility with minimal impact on myocardial oxygen requirement.

9) All the following predispose to digoxin toxicity , except: A) use of loading doses. B) hypokalemia C) renal disease D) quinidine E) cholestyramine.

The answer is E. Cholestyramine will bind digoxin in the gut and may be helpful immediately after oral overdose. All the other conditions predisposes to toxicity.

10. A dog is presented in severe heartfailure from dilated cardiomyopathy, you decide to institute therapy with a catecholamine. Regarding dopamine and dobutamine , all the following are true ,except: A) Both agents have a t 1/2 between 10 and 20 minutes. B) both agents have extensive hepatic metabolism. C) long term use is limited by B-receptor down regulation D) dopamine, but not dobutamine, stimulates vasodilatory dopaminergic receptors. E) dopamine is more arrhythmogenic than dobutamine.

The answer is A . The t ½ of these agents is less than 2 minutes , that as well as their rapid hepatic metabolism, means they are effectively given only by IV infusion.

11. Heparin is used in cats after acute thromboembolism because of its inhibitory effects on coagulation. In combination with antithrombin III, it neutralizes all the following factors EXCEPT: A) XII B) XI C) X D) IX E) VIII

The answer is E. The heparin – antithrombin III complex neutralizes factor XII, XI, X, IX and II

12.Drugs which act by blocking beta adrenergic receptors comprise which class of antiarrythmic agents? A) class I, B) class II. C) class III. D)class IV.

The answer is B. Beta –blockers are considered class II agents . Class I drugs are the local anaesthetics, class III drugs prolong action potential duration, class IV drugs are the Ca2+ entry blockers.

13.Which antiarrhythmic drug is incorrectly match with its classification? A) lidocaine – class IA, B) procainamide -class IA C) tocainide- class IB D) quinidine- class IA E) flecainide- class IC

The answer is A. Lidocaine is a class IB drug like tocainide.

14. when used IV, lidocaine has all of the following effects, except: A) suppress premature ventricular contraction. B) consistently abolishs atrial arrhythmias. C) decreases Na+ conductance in automatic cells. D) it has little to no effect on sinus node pacemaker function. E) rapid metabolism by liver.

The answer is B. Lidocaine is generally effective for ventricular, but not usually for supra ventricular (atrial) tachy arrhythmias. It decrease Na+ conductance in autonomic cells and does not affect sinus pacemaker discharge . It undergoes rapid metabolism by hepatic microsomal enzymes.

15. the drug generally used for converting atrial fibrillation in horses without heart failure is A) procainamide B) quinidine C) propranolol D) diltiazem E) phenytoin

The answer is B. Quinidine is often successful in converting atrial fibrillation in horse without heart failure or significant underlying cardiac disease. Procainamide is much less effective for supraventricular arrhythmias. Propranolol along with digoxin is sometimes used if heart failure is present. These drugs would be expected to slow the ventricular response rate but not convert the rhythm to sinus rhythm. Likewise diltiazem might slow the ventricular response rate but it is usually not used clinically . phenytoin is not used in horses.

16. Regarding the adverse effects of class I antirhythmic drugs, which statement is incorrect? A)CNS excitement is the most common toxic effect of lidocaine. B) cats and horses are very sensitive to the toxic effects of lidocaine. C) exacerbation of arrhythmias is not a problem with class IA drugs. D) GI upset can occur with quinidine and procainamide. E) marked Q-T interval prolongation can occur with quinidine.

The answer is C. All antiarrhythmic drugs can have proarrhythmic effect.

17. A 9 year –old beagle has an irregular heart beat and lethargy. Radiograph show moderate cardiomegaly, ECG shows second degree heart block. Based on the information given ,appropriate therapy would include A) digoxin B) propranolol C) procainamide D) propantheline bromide. E) diltiazem.

The answer is D. Anticholinergic therapy is initially indicated for symptomatic second degree heart block. The other agents listed are relatively or absolutely contraindicated with A-V nodal disease.

V. Match the following:

A	B	C
1. angina pectoris	etidronate sodium—5	dizuresis—4
2. calcitrol	nitroglycerine—1	mithramycin—5
3. coumarins	pargyline—7	increase serum phosphorus—2
4. ethanol	promote cloting—2	interfere bone regeneration—8
5. hyper calcemia	prothrombin synthesis—3	lung tissue—6
6. heparin	prevent bleeding—8	hypertension—7
7. MAO inhibitors	inhibit ADH—4	spoiled sweet clover—3

A	B
1.Silicon coated vessels	Epsilon amino caproic acid-2
2.Cobra venom	coagulant-7
3.Fibrinolysin	Topical haemostatic-9
4.Coumarins	Absorbable haemostatic.-10
5.Heparin	Styptic-8
6. Sodium EDTA	anticoagulant-1,2,3,4,5,6
7. Viper venom	Sweet clover poisoning-4
8.Ferric chloride	Chelate calcium.6
9. Oxidised cellulose	Mast cells-5
10. Sodium alginate	Hydrophobic surface-1

VI.Answer the following :

1.Classify anti thrombotic agents: Briefly explain cyclooxygenase inhibitors. 1. Cyclooxygenase inhibitors 2) Adenosine receptor inhibitors 3) Glycoprotein IIb and IIIa inhibitors 4) thromboxane

inhibitors 5) Miscellaneous. Antithrombotics: (antiplatelet) agents which inhibit platelet activation and aggregation. Useful in prophylaxis of thrombotic disorders – more useful in prevention of arterial thrombosis- do not dissolve existing thrombi but inhibit growth and recurrence of it. Classes are a)Cyclooxygenase inhibitors,b) Adenosin diphosphate receptor inhibitors, c)Glycoprotein inhibitors, d)Thromboxane inhibitors, e)Miscellaneous. I.Cyclo oxygenase inhibitors- Aspirin, NSAID irreversibly inactivate cyclooxygenase (COX) enzyme. Reduce synthesis of thromboxane A2- a potent vaso constrictor and inducer of platelet aggregation. Low dose is more effective than high dose. Other COX inhibitors include aloxiprin Carbasalate.

2.Classify anti thrombotic agents: Briefly explain Adenosine diphosphate receptor inhibitors. inhibitors. . 1. Cyclooxygenase inhibitors 2) Adenosine receptor inhibitors 3) Glycoprotein IIb and IIIa inhibitors 4) Thromboxane inhibitors 5) Miscellaneous. Antithrombotics: (antiplatelet) agents which inhibit platelet activation and aggregation. Useful in prophylaxis of thrombotic disorders – more useful in prevention of arterial thrombosis- do not dissolve existing thrombi but inhibit growth and recurrence of it. Adenosine diphosphate (ADP) receptor inhibitor – Thienopyridines is a new class of antithrombotic drug , mediate their antithrombotic action by inhibiting ADP P2Y receptor. It include clopidogrel used in coronary artery disease, cerebro vascular disease, peripheral vascular disease. Prasugrel, ticlopidine and ticagrelor are other examples.

3.Classify anti thrombotic agents: Briefly explain Glycoprotein inhibitors. . 1. Cyclooxygenase inhibitors 2) Adenosine receptor inhibitors 3) Glycoprotein IIb and IIIa inhibitors 4) thromboxane inhibitors 5) Miscellaneous. Antithrombotics: (antiplatelet) agents which inhibit platelet activation and aggregation. Useful in prophylaxis of thrombotic disorders – more useful in prevention of arterial thrombosis- do not dissolve existing thrombi but inhibit growth and recurrence of it Glycoprotein IIb and IIIa inhibitors – new class of potent platelet aggregation antagonist-abciximsb is a fragment of a chimeric monoclonal antibody against IIb and IIIa receptors on the platelets another drug is Eptifibatide from rattle snake block II b and IIIa.

4.Classify anti arrhythmic drugs with examples. Class I. Sodium channel blockers- quinidine, lidocaine, flecainide Class II. Beta adrenergic receptor antagonist-Propranolol, atenolol Class III.- Potassium channel blockers like Amiodarone, bretylium. Class IV. Calcium channel blockers like Verapamil, diltiazem, nifedipine.

5.Classify vasodilators give one example each.

I. Arterial vasodilators:

1. Direct acting arterial vasodilators-hydralazine

2.Calcium channel blockers-Diphenyl alkalamines-Verapamil.

Benzothiazepines-diltiazem.

Dihydropyridines-nifedepine.

3. Potassium channel openers – pinacidil, cromakalim.

II. mixed arterial and venous vasodilators:

1. Direct arterial and venous vasodilators a)nitroprusside

   b) organic nitrate- glyceryl trinitrate.

2. Drugs acting on rennin –angiotensin –aldosterone system.

   a) ACE inhibitors-captopril

   b) Angiotensin receptor antagonist-losartan

3. Drugs acting on adrenergic system

   a) Alpha adrenoceptor antagonist.

   b) mixed alpha and beta adrenoceptor antagonist.-labetalol.

   c)adrenergic neuron blocking drug-methyl dopa

   d)adrenergic agonist-clonidine.

4) Miscellaneous-Xanthines, papaverine.

III. Inodilators-pimobendan

6.Classify haemostatics with examples.

I. Topical haemostatics (also called as absorbable haemostatics)

1. Coagulants /clotting factors- thromboplastin, thrombin.
2. Occlusives /artificial matrix-fibrin foam, oxidized cellulose.
3. Vasoconstrictors- epinephrine.
4. Styptics-ferric sulphate, alum.

II. Systemic haemostatics.

A- 1.Coagulants-vitamin K analogue-menadione
2.Blood and blood components- whole blood, fresh frozen plasma.

B. fibrinolytic inhibitors/ antifibrinolytic drugs-aminocaproic acid.

C. miscellaneous drugs-Protamine sulphate, oxalic acid.

7.Classify cardiac stimulants with examples.

I. Cardiac glycosides-digitoxin.
II. Phosphodiesterase inhibitors.
a)Methyl xanthenes-aminophylline.
b)Bipyridine derivative-amrinone
c)Pyridazone derivatives-pimobendan.

d)Miscellaneous-enoximone.

III. Beta adrenergic agonist-Epinephrine.

IV.Miscellaneous-Calcium , glucagon.

8.Classify anti arrhythmic drugs with examples, brief their mechanism of action.

Broadly classified in to IV class.

Class I – membrane stabilisers, decrease fast inward sodium current-stabilise membrane-slow conduction-decreased excitability and automaticity-

I A- quinidine , procainamide-slow conduction ,increased duration of action potential, prolong QRS complex and QT interval.

I B- Lidocaine, mexiletine, phenytoin- little change in conductivity, decrease action potential duration, QRS complex unchanged QT interval unchanged.

I C-Flecainide, propafenone- slow conduction with out change in action potential duration.

II. Atenolol, propranolol, carvedilol-Beta adrenergic blockade, reduces effect of sympathetic stimulation.

III. Sotalol, amiodarone-selectively prolong action potential duration and refractory period, anti adrenergic effect, prolong Q.T.interval.

IV. Diltiazem, verapamil- decreases slow inward Ca++ current.

Other agents with anti arrhythmic action-Digitalis –action is mainly from indirect autonomic effect. Atropine - increase vagal tone,

9.Mechanism of action of Digitalis on heart. Digitalis inhibits Na+, K+ ATP ase , outward pumping of Na+ is slowed –increased sodium augment transmembrane exchange of intracellular Na for extracellular Ca++, calcium is increased and its delivery to contractile protein is increased-thus the positive inotropic effect is gained. Proportionate increase in oxygen consumption is also seen.

10.mechanism of action of Antiplatelet drugs: anti platelet drugs increase the cAMP level in platelets- is inhibitory ,while a decrease in cAMP is pro-aggregatory. Aspirin , ticlopidin are antiplatelet drugs.

11.Mechanism of nitroprusside as a vasodilator-metabolised to nitrous oxide in endothelial cells and RBC. Nitrous oxide activate guanylate cyclase enzyme in vascular smooth muscles and increase intracellular production of cGMP-GMP in turn decrease calcium influx and stimulates calcium movement from cytoplasm to endoplasmic reticulum and reduce calcium available to bind with calmodulin.

12. Action of Amrinone on heart. It is a bipyridine -cardiac inotropic agent – pharmacologically unrelated to cardiac glycoside- selective inhibitor of the phosphodiesterase III which is specific for

intracellular degradation of cAMP in the heart, blood vessels. It increase myocardial cAMP and transmembrane influx of calcium. Thereby directly stimulate contractility- does not inhibit Na+ K+ ATPase action, is independent of tissue catecholamine and adrenergic receptors.

13.Mechanism of action of pimobendan.-it inhibits the function of phosphodiesterase III and increase the binding efficiency of cardiac myofibrils to calcium ions.

14.Heparinised blood is not recommended for differential count, Why?. WBC will disappear in heparinised blood that is why it is not recommended.

15.How clopidogrel act as an antithrombotic drug? It inhibit ADP binding at platelet receptors and subsequent ADH mediated platelet aggregation.

16.How Warfarin bring about anti coagulant action?Warfarin inhibits the enzyme vitamin K epoxide reductase, responsible for activating the vitamin K dependent factor II, VII, IX, and X.-

17.How heparin act as anti coagulant? Effect is produced through anti-thrombin activity, which in turn inhibits factor IX, X, XI, and XII and thrombin factor II. It also stimulate release of tissue factor inhibitors from vescular sites which helps reduce coagulation cascade activation.

18.How Dicoumarol act as an anticoagulent. It reduce prothrombin synthesis in liver, and block clotting factors VII, IX, X .

19.How styptic will arrest bleeding ? It will arrest bleeding by precipitation of proteins in the blood.

20.How we can bring about vasodilatation? Vasodilatation can be brought about by a) suppression of the vasomotor centre b)blocking of sympathetic ganglia c) blocking of adrenergic neurons d) blocking of catecholamines or prevent the synthesis e) blocking of Alpha receptors f) stimulation of Beta receptors g) capillary paralysis. h) direct relaxation of vascular smooth muscles h) metabolic products from organs like muscles, kidney, bowel – extracts from various tissues of the body (contain acetyl choline, histamine, choline, ATP, kinines, Prostaglandins causes fall in B.P when injected . Vasodilators are useful in several conditions like vascular spasms of -general or local nature, coronary diseases.

21.How aspirin act as an antiplatelet drug? It irreversibly inhibits cycloxygenase which reduces prostaglandins and thromboxane-A2synthesis and therefore subsequent platelet aggregation .

22.What is digitalisation ? Initial administration of a large amount of digitalis in several divided doses over a relatively short period (24-48 hrs) to quickly achieve the desired therapeutic effect is known as digitalisation.

23.What is the difference between haemostatic and styptics? haemostatics are agents which promote clotting by the involvement of clotting mechanism, styptics are agents which arrest bleeding by precipitation of blood proteins. Haemostatics are absorbed from the site of application after varying period of time . Arrest bleeding by formation of artificial clots- provide mechanical matrix that facilitate clotting. Not effective in controlling bleeding from arteries, veins. (eg.absorbable gelatine, oxidized cellulose, fibrinogen, fibrin form, sodium algenate).Mostly used in combination with thrombin , interfere bone regeneration result in cyst formation, styptic eg. ferric chloride

24.What is cryoprecipitate: cryo precipitate is a white foamy precipitate formed after centrifugation of partially thawed fresh frozen plasma that has been frozen for 6 months or less. Contain concentrated source of coagulation factor VIII, Von Willebrand factor, fibrinogen and fibronectin. Indicated for haemophelia, Von Willebrand disea,hypofibrinogenaemia . Compatibility testing is not strictly necessary. Dose for Dogs --one unit/10 kg. i/v. repeated until bleeding is arrested.

25.Why low dose of aspirin is more effective than high dose in reducing platelets aggregatioin? Low dose inhibits the synthesis of TXA2 only, while high dose it also blocks prostacyclins a platelet anti aggregator , net effect is a reduction in overall anti aggregatory effect in high dose.

26.What are the methods by which hypotension can be brought about.. By using 1) cortical depressants like Barbiturates. 2) Inhibition of sympathetic vasomotor activity - Rauwolfia, Hydralazine 3) Ganglion blocking drugs -Quarterinary ammonium compoundslike- Hexamethonium 4) Sympathetic blocking –Bretylium and guanethidine 5) Adrenergic receptor blocking- Alpha blocker- Phentolamine, Beta blocker-Propranolol 6) drugs affecting vascular reflex- Veratrum alkaloids. 7) Hypotensive diuretics –Thiazides 8) Monoazmine oxidase inhibitors-Pargyline 9) Renin angiotensin inhibitors-AT 1 antagonist-Losartan, ACE inhibitors Captopril 10.) Aldosterone antagonist-Spironolactone 11) miscellaneous- Sodium nitroprusside.

27.What is mucosal barriers/ferritin curtain: it is applicable to iron. If the iron store is less the absorption of iron will be more .If the iron reserve is sufficient all the apoferritin in the intestinal mucosal cell has been combined with iron . The additional iron does not assimilate in mucosal cell and its absorption will be blocked. This is called mucosal barrier.

28.What is the mechanism of action of Nitric oxide as vaso dilator: Nitric oxide activate guanyl cyclise enzyme in vascular smooth muscles and increase intracellular production of cGMP. GMP in turn decrease calcium influx and stimulate calcium movement from cytoplasm to endoplasmic reticulum and reduce calcium available to bind with calmodulin, cGMP activate protein kinase G to open potassium channels and close sodium channels there by inducing hyperpolarisation of the muscles.

VII. Write short note on:

1.Alpha adrenergic blockers in hyper tension:

Specific alpha 1 blockers are preferred, which reduce peripheral vascular resistance. Some of the alpha adrenergic blockers with antihypertensive action include phenoxybenzamine, phentolamine, prazosine. Phenoxybenzamine is a haloalkylamine derivative block both alpha 1 and alpha 2 adrenergic receptor. Action is irreversible and is used in the treatment of hypertension specifically that caused by phaeochromocytoma. Phentolamine is an imidazolin and is a congener of tolazoline. Action on cardiovascular system is similar to phenoxybenzamine. Prazosine is an extremely potent and highly selective alpha one blocker , action on alpha 1 is 1000 times more than alpha 2- relaxes both arterial and venous smooth muscles-does not produce reflex tachycardia.terazosin, dexazosin, trimazosin are other examples.

2.Anti arrhythmic drugs:

Class I antiarrhythmic agents: Sodium channel blockers. Block the voltage sensitive sodium channels by same mechanism as local anaesthetics. They possess a membrane stabilising effect resulting in reduced rate of depolarisation . This also produce a decrease in excitability and conduction velocity. I a—moderately slow conductivity, prolong duration of action potential, inhibits pace maker depolarisation and suppress AV conduction--useful in ventricular tachyarrhythmias. Eg. Quinidine, procainamide, disopyramide. Class I b –decrease the duration of action potential and shorten the refractory period-do not depress AV conduction. useful in ventricular arrhythmias. Eg.lidocaine, mexiletine, tocainide, phenytoin, aprindine. Class I c-most potent sodium channel blockers- depress the rate of rise of action potential, cause marked decrease in conduction veloicity. Bind slowly to sodium channels to cause their inactivation and long recovery from Na+ channels. Less frequently used in veterinary medicine. Eg. Falcainide, lorcainide.

II anti arrhythmic drugs-beta adrenergic receptor antagonist. They inhibit sympathetic activity on the heart. They are used mainly to suppress adrenergically mediated arrhythmias.eg. propranolol, atenolol, sotalol—explain each.-------

III anti arrhythemic drugs : Mostly potassium channel blockers-prolong the process of repolarisation causing widening of action potential duration and effective refractory period-used in supra ventricular and ventricular tachyarrhythmias.eg. amiodarone, dronedarone, bretylium, sotalol-explain .....

IV antiarrhythmic drugs: calcium channel blockers- interfering with or blocking the slow voltage sensitive calcium channels-shorten the plateau phase of action potential and reduce the force of contraction. They are the rug of choice for severe acute supraventricular tachycardia.eg. verapamil, diltiazem, nifedipine.

V.Miscellaneous: eg. Magnesium, adenosine.

3.Anti coagulants for laboratory use/invitro anticoagulants: some of the anticoagulants are used for lab. purpose only . they share a common mode of action, made calcium ion (factor IV) unavailable for coagulation- not used for blood transfusion. Oxalates of Sodium ,potassium, and ammonium -causes distortion of cells and dumping of platelets (2mg/ ml of blood). Sodium fluoride combine with calcium –good anticoagulant for blood glucose estimation, because they interfere with some enzymes which is glycolytic in action-(2.5 mg/ml of blood). EDTA sodium salt –chelate the calcium –complex is still soluble but no longer free ion. Cellular details are preserved. (0.1 to 0.2 mg/ml of blood). Sodium citrate (trisodium citrate) also can be used vitro -chelate the calcium ions –collected blood will remain un cloted for 35 days. ACD solution(Acid citrate dextrose) for collection of blood for transfusion-(Citric acid 0.8 gm, Sod. citrate 2.5 gm, Dextrose 2.5 gm) (15 ml/100 ml blood). Heparin –used invivo and invitro- invitro only for some biochemical and haematocrit studies.

4.ACE inhibitors (Angiotensin converting enzyme inhibitors) Drugs in this group prevent formation of angiotensin II from angiotensin I- mainly three groups 1) SH containing ACE inhibitors (captopril, zafenopril) 2)Dicarboxyl containing ACE inhibitors (eg.enalapril, lisinopril) 3) phosphinate containing ACE inhibitors (eg. Fosinopril. Captopril) binds to enzyme site where angiotensin one is binding and prevent conversion to two. They also block the secretion of aldosterone block the rate of inactivation of bradykinin . used as a vasodilator in the treatment of CHF. Not recommended in pregnant animals.

5.Actions of inorganic nitrites : Relaxes smooth muscles by direct action (arteriosclerotic vessels will not dilate) cutaneous vessels dilate, dessipate heat, antipyretic effect, warmth in the blushed area, transitory headache, guiddines, thrombing of head, stimulate coronary supply on heart, relax bronchial muscles.

6.Calcium channel blockers: Agents suppress calcium ion influx through membrane channels in cardiac tissue, vascular smooth muscles and other excitable cell .Verapamil- developed as a coronary vasodilator –also inhibit myocardial contractile strength. Nifedipine and diltiazem are also having blocking action- effect can be antagonised by excess calcium , they are not calcium analogs (do not act by inhibiting calcium binding to receptors such as calmodulin or troponin) These agents interfere with the function of plasma membrane channels that mediate calcium entry into excitable cells. Calcium influx through specific channels gain access to intracellular organells and leads to activation of calcium dependent cellular functions. It can improve the short or long term outcome of various induced form of shock and trauma.

7.Fibric acid derivatives as hypo lipidaemic agent: Fibric acid derivatives are otherwise called as fibrates- a class of amphipathic carboxylic derivatives-broad spectrum hypo lipidemic agent. Main action is triglyceride lowering property –also reduce LDL cholesterol and raise HDL cholesterol. It act on peroxisome proliferator activated receptor alpha (PPAR alpha)which activate the enzyme lipoprotein lipase and finally decrease formation of VLDL(which is converted to LDL and triglycerides) and increase in HDL cholesterol- Eg.Fenofibrate, fenoglide-common side effect is stomach pain, back pain, headache, running nose, gall stones and liver problems. it will interact with blood thinners, cyclosporine, other cholesterol lowering drug not recommended in pregnancy.

8.Fibrinolytic agents: Agents promote conversion of the inactive plasminogen to active fibrinolytic enzyme plasmin. When plasminogen activating agents comes in contact with the clot, fibrin bound gel- phase plasminogen is activated to plasmin locally with selective fibrinolysis. Activation can also enhance with hormones like androgen, corticosteroids, Growth hormone, enzymes like- streptokinase, streptodornase, urokinase.

9.Heparin as an anticoagulant : used both in-vivo and in-vitro to prevent coagulation of blood. Blood collected with heparin cannot be stored , and also inactivate platelets. In-vivo it is used to prevent enlargement of thrombi , for immediate transfusion of blood. Commercial source is bovine lung and porcine intestinal mucosa. It is seen complexed with histamine in mast cells. The action of heparin is indirect it facilitate the anticoagulant action of endogenous inhibitory factor, antithrombin III (AT III) and heparin co factor II. - inactivate factor II, and factor X. other factors neutralized are IX, XII, XIII. It prevent platelet aggregation and adhesion- not absorbed from G.I tract -give i/v. heparin overdose can be treated with protamine sulphate. Interact with aspirin, phenyl butazone, warfarin, - interfere with thyroid hormone.

10.How we can prevent clotting of blood? a)prevent platelets disintegration by providing hydrophobic surface as silicon coated vessels. b.)remove ionic calcium from the blood using agents like Sodium EDTA, sodium citrate, sodium fluoride. c) interfere prothrombin formation and Factor V,VII,IX,X. Eg. Coumarins. d) inhibit conversion of prothrombin to thrombin.eg. e) drugs interfere with action of thrombin.(fibrinolysin)

11. Invivo anti coagulant- Heparin, Coumarins, heparinoids, heparan sulphate ,danaproid Heparinoids- naturally occurring /synthetic non heparin glycosaminoglycan –similar action as heparin. Heparan sulphate- heparin like linear polysaccharide found on cell surface and extracellular matrix of many tissues-less potent than heparin, Explain each .....

12.Mechanism of action of hydralazine as a vaso dilators-increase guanosine monophosphate level thereby decrease the action of second messenger IP3 which limit the release of calcium from sarcoplasmic reticulum of smooth muscle –result in relaxation of blood vessels.

13.Systemic anti coagulants/ invitro anticoagulants: are inhibitors of vitaminK-slow acting-antagonize vit.K. Coumarin derivatives- synthetic compo und- primarily developed from dicoumarol seen in spoiled sweet clover. Warfarin sodium is a coumarin anticoagulant developed originally as a rodenticide, now it is used as oral anticoagulant. They are chemically related to vit- K- competitive inhibitor of vitamin K-(inhibit vit.K epoxide reductase enzyme and interfere with regeneration of vitamin K) inhibit prothrombin synthesis- inhibit K depedent clotting factors. Factor II, VII, IX, X. action seen in 1-3days last for 4-7 days. Treatment of over dose is vit.K1(phytomenadione). Dicoumarol and acenocoumarol are other examples .Indane diones- (anisindione and phenindione) are examples action similar to warfarin. Direct inhibitor of coagulation factor Xa. Xabans-(eg. Rivaroxaban ,apixaban). Hirudin-naturally occurring protein present in salivary glands of leeches-most potent inhibitor of thrombin . It prevent not only clot formation but also dissolve the clot and thrombi. Bivalirudin is the synthetic congener having similar action as hirudin. Desirudin and lepirudin are other examples. Argatroban is a direct thrombin inhibitors. Danaparoid-sulphated glycosaminoglycuronans derived from porcine intestinal mucosa. .Oligosaccharide eg. Fondaparinux- synthetic pentasaccharide similar to heparin used mainly to prevent deep vein thrombosis. Idraparinux – another synthetic oligosaccharide similar to fondaparinux

14. Organic nitrates in coronary disease: Several organic nitrates are used –a) Amyl nitrate-volatile liquid ,administered as inhalation, (destroy in the G.I.tract)-capsule form-broke in handkerchief and inhale. b) Ethylnitrate-(spirit of nitrous ether) –common ingredient of diaphoretic mixtures. c) Glyceryl trinitrate (nitroglycerine)-explosive liquid-converted to nitrite-tablets are placed sub-lingually-inactivated by lungs d) Erythrityl tetra nitrate.

15.Peripheral vasodilators in CHF: they include prazosine, hydralazine hydrochloride, captopril and enalapril , calcium channel blockers. Prazocine is an alpha 1 adrenergic blocking agent. Hydralazine hydrochloride is an arteriolar dilator. Captopril and enalapril are ACE inhibitors- block the formation of angiotensin II a potent vasoconstrictor agent. Calcium channel blockers like verapamil. Other vaso dilators are nitroprusside , nitroglycerine, isosorbide dinitrate explain each-

16.Quinidine is a class one antiarrhythmic agent.: Quinidine sulphate ,originally from- dextro isomer of quinine alkaloid from cinchonabark- .– block the myocardial Na+ channels- due to decrease sod.influx there is decreased efflux of potassium that helps in the prolonged action potential . prolong the effective refractory period of atrial and ventricular muscles. It exert an atropine like action and antagonise the cardiac action ofacetyl choline released by vagas . At higher concentration it also inhibits Ca++ channels- decreased myocardial conduction velocity and automaticity in purkinje fibers reduce excitability by increasing threshold for excitation- In some animals it may show side effects like urticaria, digestive disturbances, rhinitis, respiratory difficulty. used in small animals.

17.Strepto kinase, streptodornase ,urokinase : Streptokinase is a protein from haemolytic streptococci used as a clot dissolving drug-plasminogen activator activated to plasmin. More effect on recent thrombi than thrombi more than 3 days old. May degrade some cloting factor V, VII .Urokinase- urine protease enzyme that activate plasminogen – obtained from cultured humen kidney cells. Streptodornase is similar to streptokinase. Other fibrinolytics include. Ancrod is a proteolytic enzyme from venom of snakes of viperid family --fibrinolytic and anticoagulant action. Fibrinolysin from bovine plasma, Brinase from fungi.

18.Systemic coagulents: Thromboplastin-promote conversion of prothrombin to thrombin, conjugated estrogen stimulate AC globulin and prothrombin activity, Oxalic acid antagonize anti-thrombin, a mixture of oxalic acid and melonic acid is used .Vitamin-K- synthetic vitamin K (menadion) is used. Sodium citrate in very small quantity stimulate platelet production in bone marrow- Carbazochrome salicylate- Tolonium chloride, congored, cephalin, calcium, russels viper venom, amino caproic acid are other examples.

19.Systemic haemostatics/coagulants, blood –fresh whole blood blood components are indicated. Used in acute haemorrhagic syndrome. Vitamin K- exists in 3 forms orK1, K2 andK3. K1 (phytonadione) present in plants. K2-(menaquinone)-produced by microbs. K3(menadione) synthetic- aids in the production of functional clotting factor. Explain each.....

20.Systemic anti- coagulents: a) Heparin – occurs in many tissues especially lung and liver- stored in mast cells, granules of basophils, intima of blood vessels. On contact with basic substances it is destroyed. It has anti-thromboplastin, anti- prothrombin and anti- thrombin action- inactivated by liver, dextrose prolong the action. b) Coumarins- synthetic anti coagulant developed from dicoumarol-it is a competitive inhibitor of vitamin-K, action will be seen only after 48 hours –there is no effect on circulating prothrombin – affect synthesis of prothrombin and Factor VII, IX,X C) Indane dions, cobra venom and fibrinolysin are other examples.

21.Topical haemostatic / topical coagulants. Several locally applied substances can block capillary bleeding if coagulation mechanisms are intact. A) Thromboplastin- produced by platelets and tissues in response to trauma. Commercial preparation , a powder, extracted from bovine brain or acetone extract of lung / brain of rabbit. It promote conversion of prothrombin to thrombin- used as local haemostatic in surgery –apply by spray or direct application. B) Thrombin- white sterile powder prepared by interaction of thromboplastin and calcium with prothrombin. Convert fibrinogen to fibrin .used in bleeding from parenchymatous tissues, fixing of skin grafts. Applied topically as powder or solution- not give systemically allergic reactions may be seen since it is antigenic .C) Fibrinogen –concentrated fraction of normal human plasma – sterile white powder used over mucous membrane and skin grafts. D) Fibrin foam- insoluble substance –marketed as sponge- applied directly with pressure to haemorrhagic area. E) Absorbable gelatin sponge – water insoluble gelatin sponge – usually soaked in bovine thrombin and keep in the bleeding area on surface mucous membrane .completely absorbed in 4-6 weeks- not antigenic- used for capillary / venous bleeding. F) Oxidized cellulose-specially treated surgical gauze or sponge – facilitate gummy matrix for clot formation- used as temporary packing –available as cotton plug /gauze pads. G) Microcrystaline collagen –high affinity for wet surface- used in venoarterial anastomoses or surgery of the spleen and liver. H) Epinephrine and nor epinephrine , topically applied- transitory vaso constriction which

reduce bleeding. I) Miscellaneous- styptics- ferric chloride, ppt protein. Ferric sulphate, alum, tannic acid, zinc chloride.

22.Verapamil –it is a Calcium channel blocker with anti arrhythmic action. selectively inhibit transmembrane influx of Ca++ through the slow cation channels of the cardiac sarcolema . Block the calcium channels in the vascular smooth muscles and myocardial cells- more action on myocardial cells than vascular muscles-suppress calcium mediated depolarization and suppress automaticity in SA node, AV node and purkinje fibers- result in bradycardia- reduce intracellular free calcium concentration. Side effects – contractile depression of heart with reduced cardiac output and hypertension, pulmonary oedema, sinus brady cardia and heart block.

23. Tissue plasminogen activators ? it is a serin protease found in endothelial cells of blood vessels- involved in break down of blood clots. Promote conversion of plasminogen to plasmin, the major enzyme responsible for clot breakdown. High affinity to plasminogen bound to fibrin- so fibrinolysis of formed thrombi eg. Aheplase- produceby recombinant technology. It is superior to strepto and uro kinase in dissolving old clots. Used in pulmonary embolism, myocardial infarction and stroke. Reteplase, tenecteplase, streptokinase, urokinase are other examples.

VIII. Write Essays on

1.What are cardiac glycosides? Explain the mechanism of action ,points to be remembered in treatment with , adverse effect & interactions of digitalis glycosides.

2.Explain the role of renin- angiotensin system in the homeostasis of blood pressure, enumerate the drugs acting via this mechanism .

3. Explain ACE inhibitors.

4.Classify Topical haemostatics with examples, explain one drug from each class.

5.Explain Systemic anti coagulents.

6.Classify anti arrhythmic agents with examples, explain one drug from each class.

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