Question bank -paper -8

Antiparasitic agents.

I. Name the following.

1. An acridine derivative antigiardial drug—(Quinacrine)

2. A benzimidazole prodrug.—(Febantel)

3.An antibiotic useful against toxoplasmosis.-(Clindamycin)

4.An antibiotic which is useful against Cryptosporidiosis.-(Paromomycin, Azithromycin)

5. A semisynthetic derivative of Avermectin.—(Ivermectin)

6.A juvenile hormone analog.-(Methoprene)

7.A phenyl pyrazole insecticide .-(Fipronil)

8. An immune stimulant having anthelmintic effect.—(Levamisole)

9.An arsenical compound with good activity against heart worm.-(Melarsomine)

10.A thiamine antagonist used against coccidiosis.—(Amprolium)

11.Carbamate that mimics the action of insect growth hormone-(Fenoxycarb)

12.Insecticidal compound present in Derris.—(Rotenone)

13.A natural pyrithroid.-(pyrithrin)

14.One drug used against histomoniasis in birds.—(Dimetridazole)

15.One divalent polyether antibiotic from *streptomyces*-(Lasalocid)

16.One biodegradable organo chlorine insecticide.—(Methoxychlor.)

17.One insect growth regulator- (Methoprene, Fenoxycarb.)

18.One benzene acetonitrile having anti coccidial effect.-(Diclazuril)

19.One insecticide which inhibit cytochrome P-450 in insects.—(Piperonyl butoxide)

20.One monovalent polyether antibiotic from *Streptomyces* .-(Monensin, Salinomycin, Narasin)

21.One antimony compound used against protozoa-(Tartar emetic / Potassium antimony tartarate)

22.One juvenile hormone analogue used as insect growth regulator (Juvenoids)—(Methoprene, Cyromazine, Pyriproxyfen)

23.One chloronicotinyl insecticide.—(Imidacloprid)

24.One anticoccidial agent that can be safely used in laying birds.-(Amprolium)

25.One third generation neonicotinoid with slightly faster knock down action in ectoparasites.-(Dinotefuran)

26.One phenyl pyrazole insecticide.—(Fipronil)

27.Organism from which Ivermectin is extracted.-(*Streptomyces avermitilis*)

28.Source of Pyrethrins.—(*Crysanthemun cinerariafolium*)

29.The active principle in kamala .—(Rottlerim)

30.The antidote of melarsomine toxicity.-(British Anti Lewisite)

31.The macrolide endectocide produced by *Streptomyces avermitis*-(Avermectin)

32.The common name for antimony potassium tartrate.—(Tartar emetic)

33.The active ingredient of ether extract from male fern Aspedium.—(Filicic acid)

34.The analog of thiamine used as anticoccidial drug.-(Amprolium)

35.Three aromatic diamidines –(Diminazine, Phenamidine, Stilbamidine, Pentamidine)

36.Three anticoccedial antibiotic.-(Monensin, Lasalocid, Narasin, Salinomycin, Semduramicin)

37.Three anticoccedial antibiotic exclusively used in poultry .-(Narasin, Salinomycin,Semduramicin)

38.Three broad classes of anthelmintics.—(Antinematodal, anticestodal and anti trematodal)

39.Two antitrematodal drugs.—(Hexachlorethane, Oxiclosanide)

40.Two chitin synthesis inhibitors.—(Lufenuron, Diflubenzuron)

41.Two synthetic fly repellent.—(Dimethyl phthalate)

42.Two synergists(agents which enhance activity and stability of ectoparasiticides)—(Piperonyl butoxide, Dicarboxamide)

43.Two quinolone compound used against coccidiosis-(Decoquinate,Buquinolate)

44.Two antihistomonial drug.—(Aminonitrothiazole, Nithiazide)

45. Two nitrobenzamide anticoccidial agent—(Dinitolamide, Aklomide)

46.Three anticestodal synthetic organic compound.—(Bunamidine, Niclosamide, Bithionol)

47.Three drug useful in EPM (Equine Protozoal myeloencephalitis).-(Ponazuril, Trimethoprim sulfadiazine and pyrimethamine, Diclazuril

48.Three natural organic compound having taeniacidal action.—(Papaine, Arecoline, Ext. Filic)

49.Three insect nicotinic receptor agonist.-(Imidacloprid, Dinotefuran, Nitenpyram, Spinosad)

50.Two neonicotinoids.-(Imidacloprid, Nitenpyram)

51.Three sulfonamide recommended in coccidial infection.-(Sulfaquinoxaline, Sulfadimethoxine , Sulfamethazine)

52.Two synthetic pyrithrin.—(Allethrin, Fenvalerate)

53.Two insecticides from citrus fruits.—(Linalool, D-Limonem)

54.Two insect repellent –(Diethyltoluamide, Butoxypolypropyleneglycol)

55.Two antibiotic having antiparasitic action.—(Avermectin, Hygromycin-B)

An octopamine receptor agonist, used in the treatment of demodex infestation in dogs.—(Amitraz)

Three neonicotinoids insecticides act as neurotoxin to insect.—(imidacloprid, nitenpyram, dinotefuran)

One orally effective neonicotinoid insecticide related to imidacloprid.—(Nitenpyram)

One third generation neonicotinoid.—(dinotefuran)

Two Juvenile hormone analogs.—(methoprene and pyriproxifen)

II. Give two drug of choice each for the following disease conditions:

1.Tape worm in dogs—Niclosamide, Praziquantel

2.Trypanosomiasis.-- Antomony potassium tartrate, Homidium.

3.Amoebiasis--. Metronidazole, Furazolidone.

4.Ascariasis in dogs.-- Piperazine citrate, Mebendazole.

5.Coccidiosis in birds.-- Sulphaquinoxaline, Furazolidone.

III. Fill up the blanks with most appropriate words.

1.Amprolium is a .....antagonist.—(Thiamine)

2. Avermectins are antibiotics isolated from .....—(*Streptomyces avermitilis*)

3.Amprolium is a structural analogue of .....vitamin and it inhibits the utilisation of this vitamin by coccidia—(B1)

4. Amitraz activates Alpha2 adrenergic receptors hence adverse effect can be treated with .....-(Yohimbine)

5. Absorption of Benzimidazole will be best in animal with .....(empty/full) stomach.-(full)

6. Babesan is a diamidine compound effective against .....infection.(Babesia.)

7.Benzimidazoles affect the polymerisation of .....in the sensitive nematods.-(betatubulin)

8.Buparvaquone is used in the treatment of .....(theileriasis)

9. Chlorsulon is a benzene .....and is highly effective against Fasciola hepatica.—(Sulphonamide)

10.Drugs which cause expulsion of tape worm is called .....—(Taeniafuge)

11.Diethyl carbamazine citrate is a .....derivative .—(Piperazine)

12.Diminazine is mostly used in the treatment of .....and.....in animals .-(Babesiiosis , Trypanosomiasis)

13.Drugs which kill tape worm in situ are called .....—(Taeniacide)

14.Disophenol is an anthelmintic with high efficacy against .....species of worms.—(Ancylostoma)

15.D-limonene and Linalool are having insecticidal property and is obtained from peels of ..... —(Orange and other citrus fruits)

16. Dose of Ivermectin is .....mg/kg s.c in dogs.-(0.2 to 0.3)

17. Doramectin is used only in .....(.animal).-(Cattle)

18.Eprinomectin is used topically in cattle at the rate of .....mg/kg .-(0.5)

19.For eprinomectin no pre-slaughter or milk withdrawal period is required after treatment.(T)

20.Febantel is metabolised to .....—(Oxibendazole).

21.Febantel is a pro-drug of.....—(Oxibendazole / fenbendazole)

22.Gama-isomer of BHC (HCH) is designated as .....—(Lindane)

23.In therapeutic dose sulphadimidine specifically destroy .....generation schizonts.—(second)

24.In flea collars .....is mostly used to repel flees.—(Dichlorvos)

25.In phenothiazine treated animals photosensitization reaction occusr due to the metabolite.....--(phenothiazine sulfoxide)

26.Ivermectin is the combination of .....and.....—(dihydroavermectin B1a and dihydroavermectin B1 b)

27.Lefenuron is a. .....synthesis inhibitor –(chitin)

28.Macrolides are antibiotics produced by .....species of microbs.—(Streptomyces)

29.Melarsomine is active against adult *Dirofilaria immitis* and it is an .....compound.—(Organic arsenical)

30.Morantal is the methyl ester of .....and is stable in solution.-(pyrantal)

31.Morantel is approved for use in Horse and .....is approved for cattle.—(Pyrantel)

32.Nicarbazin is an anticoccidial drug and it is not recommended in .....hens.—(laying)

33.Netobimin is a prodrug of .....—(Albendazole)

34.Piperazine salt was originally used against .....in human beings because it is an excellent solvent for uric acid.—(gout).

35.Piperazine is mainly used against .....infection.—(Ascaris)

36.Pyrithrins are .....toxic in mammals.—(less)

37.Phenothiazine activate .....in the blood and causes haemolytic reaction.—(Lysolecithin)

38.Parvaquone and Buparvaquone are mainly used in the treatment of .....in cattle.—(Theileriosis)

39.Phenothiazine treated animals urine attain red colour due to the presence of .....metabolite in the urine.—(Leucophenothiazone)

40.Phenothiazine is a very effective antiparasitic agent in bovines, the most important toxicity of this is .....,which can be prevented by confining the animals in shades for few days following the administration of drug.—(photosensitization)

41.Suramine is used against .....(protozoa)—(Trypanosome)

42.Salicylanilides act by uncoupling of .....in the mitochondria of the parasites.-(oxidative phosphorylation)

43.The cellular enzymes of the intestinal epithelium convert phenothiazine in to .....—(Phenothiazine sulfoxide)

44.Thiophanate is a prodrug of .....—(Lobendazole)

45.The dose of Ivermectin in cattle and horse is .....mg/kg orally.-(0.2)

46.Since piperazine can only paralyse the worms in the intestine, after dosing a .....must be followed.—(saline purgative)

47.Piperazine reduces the production of .....,succinate and phosphate bonds in parasites.—(acetylcholine)

48.Pre-slaughter withdrawal period in birds given monensin is .....hours.—(72)

49.Pre-slaughter withdrawal period for sulphaquinoxaline in birds is .....days.—(5)

50.Sulphaquinoxalin is generally combined with .....in the treatment of coccidiosis in birds.—(Amprolium)

51.Spinosad , an insect nicotinic receptor agonist and is produced by the bacteria.....-(*Saccharopolyspora spinosa*)

52.Tetrachloroethylene is a colourless.....having anthelmintic action.—(volatile liquid)

53.Thiamine deficiency in host is one of the important side effect of the .....over dose.-(Amprolium)

54.The dose of diminazine diadeturate in cattle for the treatment of Babesiosis is.....-(3 to 5 mg/kg)

55.When environmental temperature is below freezing .....type of ectoparasiticide preparations are preffered.-(Pour-on, dust)

56.....is a monovalent monoglycoside polyether ionophore antibiotic produced by *Actinomsdura yumaense*.—(Maduramicin)

57.....is a pro-drug to fenbendazole and oxfendazole.-(Febantel)

58.....is a substituted benzoic acid used as anticoccidial drug.-(Ethopabate)

59.....is an anthelmintic used as non specific immune stimulant in animals.--(Levamisole)

60..... is an organic arsenical containing bismuth and is active against whipworms.—(Glycobiarsol)

61.....is an antibiotic effective against G.I.round worms. It is obtained from Streptomyces

.....—(Hygromycin, Hygroscopicus).

62.....is a praziquantel analog approved for use in dogs and cats. –(Epsiprantel)

63.....iodide is an intense blue violet powder with broad spectrum of anthelmintic activity.—(Dithiazanine)

64.Tolnaftate inhibits the enzyme .....present in the fungi.-(Squalene epoxidase)

65.....is an example of a substituted benzoic acid used as anticoccidial drug.-(Ethopabate)

The side effects of amitraz can be reversed with ……—(yohimbine)

IV. State True or False.

1.Adult and young parasite of Onchocerca are equally susceptible to Diethyl carbamazine.—(F)

2.Antimoney potassium tartrate is effective against Schistosomes.—(T)

3.Albendazole is metabolised to its sulphoxide which is an active metabolite.—(T)

4.Albendazole may be teratogenic and embryotoxic._(T)

5.All benzimidazoles except thiabendazole have a side chain at position 5 which prevent hydroxylation and hence more potent.-(T)

6.Albendazole can be recommended in first trimester of pregnancy.—(T)

7.Avermectin is a mixture of 4 major component namely A1a, A2a, B1a, B2a.—(T)

8.Avermectin and milbamycin are active against cestodes and trematodes.—(T)

9.Acquired resistance can be developed by the parasite to benzimidazole while treating.—(T)

10.Abamectin is a naturally occurring avermectin.—(T)

11.Abamectin is an endectocide with activity against both nematodes and arthropods.—(T)

12.Albendazole is a broad spectrum anthelmintic commonly used for nematode infection. It is having teratogenic effect—(T)

13.Albendazole is not active against giardia.—(F)

14.Along with Methyridine no purgative is necessary, when administered orally against round worms.—(T)

15.Amprolium is a structural analogue of Thiamine.—(T)

16.Amprolium in high dose may cause Thiamine deficiency in the host. –(T)

17.Amprolium should be administered with B complex vitamins in the treatment of coccidiosis in birds.(F)

18.Amprolium has no pre slaughter withdrawal time.—(T)

19.Amitraz is effective in the control of demodectic mange in dogs.-(T)

20.Among organophosphorus(O.P) and organochlorine (O.C) insecticides O.P .has a cumulative and biomagnifications effect.-(F)

21.Aminonitrothiazole and nithiazide are specific for histomonial infection.—(T)

22.Antimony potassium tartrate is otherwise known as tartar emetic.—(T)

23.As anticoccidial quinolones interfere with the cytochrome C mediated electron transport system.—(T)

24.Arecoline is effective against tape worms.—(T)

25.Berenil is one of the drug of choice in the treatment of Babesiosis.—(T)

26.Benzimidazoles are more effective in ruminants than simple stomach animals.—(T)

27.Benzimidazoles have ovicidal activity on nematodes.-(T)

28.Benzimidazoles except fenbendazole are not recommended in lactating animals.-(T)

29.Benzimidazoles give better anthelmintic action with a single large dose than divided dose.—(F)

30.Benzimidazoles produce vermicidal action primarily due to binding to beta tubulin.—(T)

31.Benzyl benzoate is effective in sarcoptic mange in dogs.—(T)

32.Bithionol is a substituted phenol with antibacterial antifungal anthelmintic properties.—(T)

33.Biphenium hydroxyl naphthoate is a quarterinary ammonium compound having activity against hook worms.—(T)

34.Benzimidazoles, fenbendazole , oxfendazole and albendazole are effective against tape worms in dogs.(T)

35.Cats are particularly susceptible to pyrethroid induced CNS disturbances.-(T)

36.Cypermethrin, fenvalerate and deltamethrin have broad spectrum of insecticidal action.—(T)

37.Canine heart worms and lung worms are highly susceptible to diethyl carbamazine citrate.—(T)

38.Carbon tetra chloride is a volatile liquid very effective in liver fluke , discontinued because of its toxicity.—(T)

39.Co-Trimazine is a combination of Trimethoprim and Sulphadiazine.—(T)

40.Copper sulphate is used as treatment of ring worm and monesia.-(T)

41.Co administration of Levamisole and Pyrantel increases toxicity.-(T)

42.C lorsulon is a sulfonamide that is effective against both mature and immature liver fluke in cattle.-(T)

43.Clorsulon should not be used in lactating animals.(T)

44.Clinical signs of OP toxicity include SLUDD.(salivation, lacrimation, urination, defecation, dyspnea).-(T)

45.Coumaphos is an O.P compound approved for use in cattle as anthelmintic.__(T)

46.Decoquinate is a quinolone used to prevent coccidiosis in cattle, sheep, goat, birds.-(T)

47.Decoquinate is not advisable in milking animals or laying hens.-(T)

48.Dexamisole is more active against parasites than levamisole.—(F)

49.Dextro form of tetramisole is toxic.—(T)

50.Diamfenetide causes vacuolation of the flukes tegument and induce paralysis.—(T)

51.Dichlorvos is an Organo phosphorus anthelmintic.—(T)

52.Dichlorvos is incorporated in to polyvinyl chloride resin for the making of flea collars.—(T)

53.Dichlorophen is an anticestodal agent having fungicide action also.—(T)

54.Diethyl carbamazine citrate is a piperazine derivative.—(T)

55.Diethyl carbamazine citrate is approved mainly for the prophylaxis of heart worms ..—(T)

56.Disophenol is mainly used against blood sucking parasites.—(T)

57.Diclazuril an anti coccidial agent and it is not recommended in laying hens.-(T)

58.Diethyl carbamazine citrate is a piperazine derivative, it sensitize microfilaria for phagocytosis.—(T)

59.Diethyl carbamazine citrate will irritate in an empty stomach.—(T)

60.Diethyl carbamazine citrate is active against filariasis.—(T)

61.Diminazine is marketed in combination with phenazone (Berenil) —(T)

62.Disophenol is available as powder as well as injectable form, it is very effective in anchylostomiasis.(T)

63.Doramectin is a biosynthetic endectocide.—(T)

64.Doramectin should not be administered in dairy cattle above 20 months.-(T)

65.Emetine is an indirectly acting amoebicide.—(T)

66.Febantel is a benzimidazole prodrug.—(T)

67.Fenbendazole can be recommended in lactating cow.-(T)

68.Fenbendazole and oxfendazole are effective against strongyles in horses.-(T)

69.Fenbendazole is effective against Ascaris in swine.-(T)

70.Fenbendazole is effective against hookworms and whipworms in dogs.-(T)

71.Foscarnet is a pyrimidine analogue.-(F)

72.Pyrantel is a depolarising neuromuscular blocking agent used as antinematodal drug.-(T)

73.Bunamidine is a potent antineoplastic agent.-(F)

74.Monensin is a poly ether antibiotic used as anti coccidial agent and growth promoter in cattle.-(T)

75.Imidacloprid is a neonecotinoid insecticide .-(T)

76.Iasalocid is an ionophore antibiotic.-(T)

77.Fipronil blocks the GABA regulated chloride channels in the susceptible parasite.—(T)

78.Fipronil is a safe pesticide against fleas and ticks for topical application in dogs.-(T)

79.Goats are highly sensitive to phenothiazine and may develop toxicity.—(T)

80.Griseofulvin is a broad spectrum fungicidal drug-(F)

81.Herbivores fed fiber rather than concentrate before receiving an oral dose of benzimidazole have a better absorption .-(T)

82.Haloxon is an Organophosphorus anthelmintic.—(T)

83.Homidium is primarily used in the treatment of trypanosomiasis.—(T)

84.Homidium interfere with cell division in susceptible protozoa.—(T)

85.High dose of amprolium cause thiamine deficiency in the host.—(T)

86.Ivermectin is derived semisynthetically from avermectin.—(T)

87.Ivermectin is contraindicated in collies or collie mixed breeds of Dogs.—(T)

88.Ivermectin is not recommended for young animals.—(T)

89.Ivermectin is not approved for dogs.-(T)

90.Immature round worms are highly susceptible to phenothiazine.—(T)

91.Levamisole is an optical isomer of Tetramisole.—(T)

92.Levamisole is very effective against strongyloids in cattle.(F)

93.Levamisole is very effective against strongyloids in pigs.(T)

94.Levamisole is one of the most toxic anthelmintics.(T)

95.Levamisole ,in addition to anthelmintic action possesses immunomodulatory effect.—(T)

96.Levamisole stimulate cell mediated immunity.—(T)

97.Linalool is an extract from fresh peel of orange and other citrus fruits.—(T)

98.Macrolide endectocides are antibiotics derived from *Streptomyces*.-(T)

99.Macrocyclic lactones are effective against larvae of heart worms.-(T)

100.Melarsomine is highly toxic in cats.—(T)

101.Milk from animals treated with monensin and lasalocid is safe for consumption.-(T)

102.Mebendazole is not recommended in pregnant animals.—(T)

103.Mebendazole is not generally used in cattle.—(T)

104.Metaflumizone is a fleacide for topical spot-on use in dogs and cats.-(T)

105.Metronidazole is having significant antibacterial action in addition to antigiardial action.—(T)

106.Metronidazole causes breakage of DNA in susceptible protozoa.—(T)

107.Methyridine, an antiparasitic agent is available both as injection and oral solution, since it react with rubber it is not stored in rubber caped containers.—(T)

108.Milbemycin is a macrolide antibiotic.—(T)

109.Milbemycin oxime is effective against demodectic mange.—(T)

110.Milbemycin is having potent endectocide activity.—(T)

111.Moxidectin is a semi synthetic anthelmintic obtained from macrocyclic lactone nemadectin.—(T)

112.Moxidectin is a derivative of avermectin.—(F)

113.Methoxychlor is highly biodegradable analogue of DDT.—(T)

114.Ionophore antibiotics primarily have prophylactic value as an anthelmintic.—(T)

115.Ionophore antibiotics interfere with development of immunity to coccidia.—(F)

116.Ivermectin is a neutural macrolide anthelmintic –(F)

117.Ivermectin should not be administered to dairy cow above 20 months.-(T)

118.Ivermectin is effective against all ectoparasites.-(T)

119.In ivermectin sensitive Collies selamectin is safe.-(T)

120.Milbemycin is a macrocyclic lactone having antiparasitic action.-(T)

121.Moxidectin is a macrocyclic lactone.-(T)

122.Moxidectin is a weak inhibitor of P-glycoprotein.-(T)

123.Melarsomin is a trivalent arsenical compound with good activity against heart worms.-(T)

124.Metronidazole is a broad spectrum antiprotozoal drug .-(T)

125.Netobimin is a benzimidazole prodrug.—(T)

126.Niclosamide is active against taenia.—(T)

127.N- butyl chloride is administered in gelatine capsules against hook worms.—(T)

128.Nitroxynil is an orally administered fasciolicide.—(F)

129.Nitroscanate is a substituted phenol anthelmintic with more effect in an empty stomach.—(F)

130.Nitroscanate is more effective in a full stomach.—(T)

131..No preslaughter or milk withdrawal period is required in treatment with moxidectin.-(T)

132.Nicarbazine treatment causes mottled egg yoke and bleach brown shelled eggs.--(T)

133.Organochlorine insecticides causes nonspecific stimulation of CNS and interfere with K+ channel.(F)

134.Oxibendazole is effective against immature strongyles in horse.-(T)

135.Oilsprey of ectoparasiticides should apply only to hair coat and not to skin.-(T)

136.Phthalofyne is very effective against whip worms.—(F)

137.Pyrimethamine is not approved for use in food animals.-(T)

138.Pyrimethamine a dihydrofolate reductase inhibitor is synergestic with sulfonamide.-(T)

139.Phenothiazine is not effective against tape worms.—(T)

140.Phenothiazine is only effective against strongyles.—(F)

141.Praziquantel is a broad spectrum anticestodal and antitrematodal drug—(T)

142.Phenothiazine,a diazine dye, is a pale lemon yellow coloured powder which attain an olive green purple colour on exposure.—(T)

143.Parbendazole is highly embryotoxic.—(T)

144.Piperazine acts as an anthelmintic because of its GABA receptor agonist action in the parasite.(T)

145.Piperazine produce curare like effect on myoneural junction of parasite.—(T)

146.Praziquantel and Epsiprantel are teniafuge in action.—(T)

147.Praziquantel is effective against all species of tape worms.-(T)

148.Pyrantel activate nicotinic cholinergic receptors and produce paralysis of parasite.—(T)

149.Pyrantel and Morantel are very effective against larval stages of parasite.—(F)

150.Pyrantel and morantel is coming under tetrahydropyrimidins.—(T)

151.Pyrantel pamoate is most active against Babesia.—(F)

152.Pyrantel is inactivated in aqueous solution upon exposure to light.-(T)

153.Pyrantel pamoate is poorly soluble in water limiting GI absorption therefore it is good for treatment of bowel worms (pin worms).—(T)

154.Pour-on ivermectin is effective as a nematocid in cattle , sheep and goat.-(F)

155.Phenothiazine is active against Amphistomes.—(F)

156.Pyrimidines act as anti-coccidial agent because of its inhibition of dihydro folate reductase enzyme involved in folic acid synthesis.—(T)

157.Pyrimethamine and sulphadiazine causes bone marrow suppression when used in toxoplasmosis.—(T)

158.Pumkin seesd are having anticestodal action.—(T)

159.Quinacrine is an acridine derivative antigiardial drug.—(T)

160.Quinapyramine is a parenterally administered antitrypanosomal drug having curative and prophylactic effect.—(T)

161.Quinolones are interfering with the Cytochrome- C mediated electron transport system in coccidia.—(T)

162.Rafoxanide is used in the treatment of liver flukes.-(T)

163.Ruminents have less blood cholinesterase than other species hence better to avoid using anticholinesterase agents as ectoparasiticides.-(T)

164.Salinomycin is a monovalent poly ether ionophore .—(T)

165.Selamectin is a semisynthetic avermectin.—(T)

166.Selamectin is used in dogs and cats.-(T)

167.Semduramicin is a semisynthetic monovalent monoglycoside ionophore. –(T)

168.Selamectin is not toxic in Collie breeds of Dogs.—(T)

169.Schistosomiasis can be treated with Antimony potassium tartrate.—(T)

170.Some of the Collie dogs show high sensitivity to Ivermectin.-(T)

171.Sulphaguanidine is having only prophylactic activity in the treatment of coccidiosis in poultry.—(T)

172.Stilbamidine and pentamidine are active against Typanosomes and Babesia.—(T)

173.Stibophen is an organic antimony complex.—(T)

174.Suramin sodium was introduced first for the treatment of sura in human beings.—(T)

175.Sulphaquinoxalin causes a marked increase in prothrombine time.—(T)

176.Tetramisole d-isomer is more active as an anthelmintic.—(F)

177.Thio organophosphates like coumaphos , diazinon are more powerful than oxy-compounds as ectoparasiticides.-(F)

178.Toltrazuril and ponazuril are anticoccidial agents.-(T)

179.The effect of Amprolium as an anticoccidial agent can be increased by combined administration with antifolate drugs.-(T)

180.The adverse effect of Na+ ionophpores include severe cardiovascular and skeletal muscle side effects.-(T)

181.The metabolite of albendazole is not active.-(F)

182.Tetramisole is more potent than Levamisole.—(T)

183. No purgative is needed with phenothiazine administration.—(T)

184.Thiabendazole is a narrow spectrum anthelmintic.—(F)

185.Thiabendazole is extensively used against Gastro intestinal parasite.—(T)

186.Thiabendazole is larvicidal and ovicidal in effect.-(T)

187.Thiabendazole is much less potent than other benzimidazoles.-(T)

188.Thiabendazole is highly effective against microfilaria.-(F)

189.To reduce the toxicity with carbon tetrachloride treatment, calcium gluconate can be administered prior to this.—(T)

190.The dose of thiabendazole is more than that of Albendazole.—(T)

191.The sulfoxide metabolite of fenbendazole is known as oxfendazole.—(T)

192.Thiabendazole is very effective against lung worms and whip worms.—(T)

193.Thiabendazole is safe to use in pregnant animals as an anthelmintic.—(T)

194.Thiacetarsamide is an organic arsenical anthelmintic.—(T)

195.Trichlorfon is an O.P compound approved for use in cattle against nematodes.—(T)

196.Trichlorfon causes inhibition of Acetylcholinesterase in nematodes—(T)

197.Vioform is a systemically acting amoebicide.—(T)

198..Bunamidine must be given in a full stomach as a taeniacide.—(F)

Metaflumizone is a neurotoxin act by blocking sodium influx in nerves of fleas causing paralysis and death. —(T)

Methoprene is a juvenile hormone analogue stable on exposure to u/v light.-(F)

Pyriproxifen is stable on exposure to u/v light. —(T)

Juvenile hormones act to mimic as growth hormone in insects. —(T)

The side effect of amitraz is mainly due to Alpfa2 adrenergic receptor stimulation.—(T)

Fipronyl is a neurotoxin of the phenylprazole class used for the treatment of fleas , ticks, lice in dogs and cats.—(T)

Imidacloprid is used for the treatment of fleas and lice, it is not absorbed systemically.--(T)

V. Write the mechanism action (as antiparasitic) of the following drugs(1-2 sentences) Avermectin, Levamisole, Praziquantel, Niclosamide, Clorsulon, Piperazine, Emodepside ,Monensin,Diamidins,Endectocide, O.P.insecticide, Carbamates, Amitraz, Imidaclopid, Juvenoides, DDT, Lindane, Fipronil.

1.Avermectin act by binding to glutamate gated chloride channel receptors- triggering chloride influx-affect propagation of action potential- paralysis and death, affect reproduction in ticks.

2.Levamisole is a cholinomimetic cause sustained muscular contraction of nematodes- paralysis –nicotinic like action. allow entry of Na+, Ca2+ for excessive body muscle contraction and thus induces paralysis.

3.Praziquantel: paralyse the worms by rapid influx of calcium in to cell- instantaneous contraction and spastic paralysis of parasite.

4.Niclosamide inhibit oxidative phosphorylation and interfere with anaerobic generation of AT P in parasite .It is a taeniacide.

5.Clorsulon inhibits 3 phosphoglycerate kinase and phosphoglyceromutase enzymes and causes blockade of main source of energy in fluke.

6.Piperazine- is a GABA receptor agonist that hyperpolarise nematode muscle causing flaccid paralysis of worms.

7.Emodepside- semisynthetic cyclic depsipeptide –it is a selective agonist of presynaptic latrophilic receptor(a Gq coupled receptor) of nematods which increases the release of inhibitory neuropeptides PF1 and PF2 and opens Ca2+ activated K+ channels thereby causing flaccid paralysis.

8. Monensin-Poly etherantibiotic binds to sodium, potassium and calcium ions- excess entry of these in to cell-ATP hydrolysis-altered membrane integrity .

9.Diamidines- binds irreversibly to DNA or nucleotide and interfere with DNA formation of parasites.

10. Endectocides- activate glutamate gated chloride channels –inhibits neuro transmission in nematodes – induce flaccid paralysis.

11.Organophosphorus insecticides- irreversibly inhibit acetyl cholinesterase in insects

12.Carbamate insecticides- inhibit the acetyl cholinesterase reversibly.

13.Amitraz -act on octopamine receptors and activate Adenyl cyclase system – inhibit Mono amine oxidase in insects

14.Imidaclopid- act as insecticide by binding to nicotinic cholinergic receptors on the post synaptic membrane.

15.Insect growth regulator- Juvenoids inhibit the formation of necessary insect exoskeleton

16.DDT- and Methoxychlor as ectoparasiticide.-a) prevent the closure of Na+ channels –leads to an increase in intracellular Na+ concentration. b) increase Ca++ by inhibiting the uptake of Ca++ in tothe endoplasmic reticulam. High Na+ causes depolarization and Ca++ will overstimulate neurotransmission which paralyse the insect.

17.Lindane (Gama BHC) increase excitability of excitable cells by blocking GABA gated chloride channel to induce depolarization.

18.Fipronil blocks GABA gated Cl- channels of arthropods to cause depolarization of the neurons there by increasing excitability followed by detachment.

VI. Multiple choice

1.Against major G I worms in ruminents following drugs are very effective a)Albendazole b) Fenbendazole c) oxfendazole d) all the above .-(D)

2.Among different isomers of Hexachlorocyclohexane one of the following is having maximum ectoparasiticidal action. a) Alpha b) Beta c) Gama d) Delta.—(B)

3.An example for guanidine group of anticoccidial drug. a) Sulphaquinoxaline, b) robenidine c) clopidol d) halofuginone.(B)

4.An example of a carbamide derivative used as antitrypanosomal drug. a) Halofuginone b) Buparvaquone c) Suramin d) Dimenazene aceturate.-(C)

5.An antitrematodal drug which is most effective against immature flukes in cattle is a)Albendazole b) Clorsulon c) Praziquantel d) **Ivermectin**.-(B)

6.An example for natural pyrethroid is a) Cypermethrin b) Permethrin c) Deltramethrin d) Pyrethrin.(D)

7.A benzene acetonitrile used as an anticoccidial drug a) Furazolidone b) Oxytetracycline c) Ethopabate d) diclazuril.-(D)

8.Clorsulon act by inhibiting a) 3-phosphoglycerate kinase b) electron transport chain c) fumarate reductase d) Beta glucuronidase.(A)

9.Drug used in the treatment of nasal schistomiasis. a) Tartar emetic b) Sodium antimony tartrate c) Trichlorophen d) All the above.—(A)

10.Diethyl carbamazine citrate can be used effectively against a) Wucheraria, b) Loa c) Onchocerca d) all the above.—(D)

11.Febantel is converted in the body to a) Fenbendazole b) Oxibendazole c) None of the above d) both a and b-(D)

12.Following are some of the properties of an ideal anthelmintic. a) Effective in removing the parasites. b) Wide therapeutic index c) Single dose treatment. d) all the above are correct.—(D)

13.Hygromycin B is an antibiotic a) produced from *Streptomyces griseus* b) produced from *Streptomyces rimosus* c) having anthelmintic action d) having antifungal action.—(C)

14.Indirectly acting amoebicide a) will increase the reaction of the body towards amoebia. b) act on microbs essential for amoebial growth. c) metabolites produced in the body will act on amoebia d) All the above.—(B)

15.Metronidazole is effective against a) Anaplasmosis, b) Babesiosis c) Trypanosomiasis d) Trichomoniasis —(D)

16.Metronidazole is effective against a) Giardia b) Ameba c) Babesia d) Histomonia e) Trichomonas.f) all the above .-(F)

17.Malathion is used for ectoparasitic control at a concentration of a) 0.5% sprey, b) 4-5 % dust , c) 5.0% sprey, d) None of the above.—(A)

18.Methoprene is a a) juvenile hormone analogue b) formamidine insecticide c) Chitin synthesis inhibitor d) anthelmintic (A)

19.One of the following antibiotic is most effective against coccidiosis. a) Aureomycin b) Erythromycin c) Spiramycin d) Terramycin.—(C)

20.One of the following antiprotozoan agent is monovalent polyether antibiotic obtained from Streptomyces species. a) Streptomycin b) Monensin c) Lasalocid d) None of the above.—(B)

21.Phenothiazine causes paralysis of worms by inhibiting a) succinoxidase b) glyoxalase c) hexokinase d) all the above.—(D

22.Pralidoxim (2 PAM) is not effective in overdosage of a)Dichlorvos b)Carbaryl c)Coumaphos d)Fenthion.- (B)

23.Photosensitisation is the main side effect of a) Pyrantel pamoate b) Piperazine c) Metronidazole d) Phenothiazine.—(D)

24.The following drugs are coming under imidazothiazole groupe. a) Butamizole b) Levamisole c) Tetramizole d) all the above.—(D)

25.The antinematodal drug which is effective against equine bots is (Gastrophilus) a) Fenbendazole b) Ivermectin c) Piperazine d) Pyramtel.-(D)

26.The ectoparasiticide which cause Xylazine like effect in animals is a) Amitraz b)Lindane c) Permethrin d)Rotenone.-(A)

27.The most appropriate anticoccidial drug is a) Sulphadimethoxine b)Lasalocid c)Decoquinate d) Amprolium.-(A)

28.The anti nematodal drug which is used in the treatment of Giardiasis in Dogs is a)Fenbendazole b) Ivermectin c)Levamisole d)Pyrantel.-(A)

29.The ectoparasiticide which is not effective in killing ticks is a)Fepronil b)Rotenone c) Amitraz d) Permethrin .-(D)

30.To prevent development of drug resistance in Coccidia the following treatment programmes can be used a) Rotation programme b) Drug mixtures c)Shuttle programme, d) All the above.—(D)

VII.Choose the correct answers from the given ones and give your explanation:

1.Of the following drugs used in heart worm therapy or prevention, which one has the greatest potential for causing icterus and bilirubinuria? a) Selamectin b) Ivermectin c) Milbemycin d) Melarsomin

The answer is D. Melarsomine is hepatotoxic. Signs include persistant vomiting, bilirubinuria hyperbilirubinemia, icterus, melena, stupor, and coma-increased serum alkaline phosphates and alanine transferase. Other drugs are not hepatotoxic.

2. Which one of the following anti nematodal drugs is effective against equine bots.(Gastrophylus)? a)Fenbendazole b) Ivermectin c) Piperazine d) Pyrantel -

The answer is B. Macrocyclic lactones, such as ivermectin are effective against bots others are not.

3.Which one of the following ectoparasiticides may cause xylaine like effect in animals? a) Amitraz b) Lindane c) Methoxychlor d) Permethrin e) Rotenone – The answer is A. Like xylazine Amitraz is an Alpha-2 adrenergic agonist . It can cause sedation, bradycardia and hyperglycemia in animals. Others have not this activity.

4. Which on of the following anthelmintics requires the longest pre-slaughter withdrawal period when used in beef cattle? a) Albendazole b) Clorsulon c) Ivermectin d) Levamisole e) Morantel.

The answer is C. In cattle the preslaughter withdrawal period for Ivermectin (35 days following SC administration and 49 days following topical application) is longer than for albendazole (27 days) , clorsulon (8) days, levamisole (2 days , oral; 7 days, SC and 11 days, topical) and morantel (14 days) .

5. A 5-year old Arabian mare is diagnosed with *strongylus vulgaris* infection. Repeated dosing with oxibendazole have failed to improve the mares condition suggesting that the worms are resistant. The veterinarian decides to use another nematocidal agent. Which one of the following should be avoided? a) Fenbendazole b) Ivermectin c) Moxidectin d) Pyrantel .

The answer is A. Cross-resistance occurs among all benzimidazoles. Thus if a nematode species become resistant to oxibendazole , one should avoid using another benzimidazole as an alternative nematocide . Ivermectn, moxidectin, and pyrantel are not benzimidazoles, thus cross resistance with oxibendazole is not a problem.

6. Which one of the following anticoccidial drug would be most appropriate to treat coccidiosis outbreak? a)Sulphadimethoxine b) Lasalocid c) Decoquinate d)Amprolium.

The answer is A. Sulfa drug with or without ormetoprim is recommended for the treatment of coccidial outbreaks in poultry, Diclazuril, not mentioned in the question can also be used to treat coccidiosis outbreak, lasalocid amprolium and decoquinate are used for prevention only.

7. Which one of the following antinematodal drug is also used in the treatment of giardiasis in dogs? a) Fenbendazole b) Ivermectin c) Levamisole d) Piperazine e) Pyrantel.

The answer is A. Benzimidazoles, for example ,fenbendazole are used for the control of giardiasis .Other antinematodal drugs are not effective against Giardia.

8. Which one of the following antinematodal drug used in cats works by increasing the release of inhibitory neuropeptides? a) Piperazine b) Febantel c) Pyrantel pamoate d) Selametin e) Emodepside

The answer is E. Emodepside activates the presynaptic latrophilin receptors, which increases the release of inhibitory neuropeptides PF 1 and PF 2, thereby causing flaccid paralysis of muscles in nematodes. Piperazine activates GABA receptors to cause flaccid paralysis. Selamectin activates glutamate –gated chloride channels , which also causes flaccid paralysis. Febantel is a pro-benzimidazole, which is metabolized into fenbendazole and oxfendazole. Benzimidazole inhibit microtubule synthesis. Pyrantel pamoate is a nicotine –like nematocide, which activates nicotinic receptors to increase muscle contraction, which is followed by paralysis.

9. Which one of the following antinematodal drug is most effective against immature (less than 14 weeks old) *Fasciola hepatica* in cattle? a)Albendazole b) Clorsulon c) Praziquantel

The answer is B. Clorsulon has excellent activity against both mature and immature *F.hepatica*. Albendazole is used to kill mature *F. hepatica* only. Praziquantel has not been tested for activity against liver flukes in cattle for economic reasons.

10. Which one of the following antinematodal drugs does not have significant activity against hookworms in dogs? a) Febantel b) Fenbendazole c) Milbemycin d) Piperazine e) Pyrantel.

The answer is D. Piperazine is effective against ascarids and nodular worms in all species , but it has no activity against hook worms. Febantel , fenbendazole, milbemycin, and pyrantel are effective against hookworms.

11. All the following anticoccidial drugs have shown good results in the control of mammalian coccidiosis except: a) Amprolium b) Decoquinate c) Monensin d) Robenidine e) Sulfaquinoxaline.

The answer is D. Sulfonamides and ormetroprim , amprolium, decoquinate , and sodium ionophores, for example , monensin are used as anticoccidial drugs in mammals. Robenidine is approved for use in birds only.

12. All the following are toxic effect of metronidazole except: a) convulsion b) carcinogenicity c) cardiac arrhythmia d) diarrhea e) reversible leukopenia.

The answer is C. Cardiac arrhythmia is not an adverse effect of metronidazole. However, metronidazole may induce lethargy , weakness, ataxia, rigidity, anorexia, vomiting, diarrhoea, and rarely reversible leukopenia. Metronidazole may be hepatotoxic , teratogenic and carcinogenic.

13. Which of the following anticoccidial drug has consistent efficacy against *Taenia*, *Dipylidium*, and *Echinococcus* in dogs? a) Dichlorophene b) Fenbendazole c) Praziquantel d) Pyrantel

The answer is C. Praziquantel is effective against all three species of tapeworms in dogs. Dichlorophen is effective against *Taenia* and *Diphylidium* , but not *Echinococcus*. Fenbendazole is effective against *Taenia* and *Echinococcus*, but not *Diphylidium*. Pyrantel at high dose is effective against horse tapeworm *Anoplocephala perfoliata*, but there is no evidence that it kills canine tape worms.

14. Piperonyl butoxide is a "synergist"that is usually found in which of the following ectoparasiticide preparations? a) Rotenone b) Pyrethrins c) Fipronil d) Lufenuron e) Methoprene.

The answer is B. Piperonyl butoxide inhibits cytochrome P450 enzymes in ectoparasites, which will help protect pyrethrins and thus increase the efficacy of this botanical ectoparasiticide. Piperonyl butoxide is usually found in the pyrethroid preparations, but not in other ectoparasiticides.

15. Pralidoxime (2-PAM) is an acetylcholinesterase regenerator that has been used as an antidote in the treatment of over dose of cholinesterase inhibitors as ectoparasiticides. However, 2-PAM is not effective in overdose of a) Dichlorvos b) Carbaryl c) Coumaphos d) Fenethion e) Phosmet.

The answr is B. 2-PAM is effective in regenerating cholinesterase that is bound covalently by organophosphates. Since carbamates such as carbaryl do not form covalent bond with cholinesterase, it is not effective in regenerating the enzyme.

16. Which of the anticoccidial drug can be legally used in laying chickens? a) Amprolium b) Clopidol c) Nicarbazin d) Diclazuril e) Sulfadimethoxine and Ormetoprim.

The answer is A. Amprolium is a quaternary compound that is minimally absorbed from the gut of animals. As a result , it is legally used in laying chickens. All other anti coccidial drugs are absorbed significantly in the gut, and thus can not be used in laying chicken.

17.Which of the following fleacides act by blocking neuronal Na+ channels that leads to flaccid paralysis of the parasites?) Fipronil b) Imidacloprid c) Metaflumizone d) Nitenpyram e) Permethrin.

The answer is C. Metaflumizone is a newly developed fleacide, which cause flaccid paralysis of the fleas by blocking neuronal Na+ channels. Permethrin prolongs the opening of neuronal Na+ channels, which cause depolarizing neuromuscular blockade of the ectoparasites. Imidacloprid and nitenpyram overstimulate the nicotinic receptors of fleas. Fipronil blocks GABA gated Cl- channels to cause depolarization of the neurons that paralyses the fleas.

18. Which of the following drugs for the treatment of equine protozoal myeloencephalitis (EPM) acts by forming a toxic-free radical in order to block cellular respiration of the protozoans? a) Trimethoprim-sulfadiazine b) Ponazuril c) Nitazoxanide

The answer is C. Nitazoxanide forms a toxic-free radical from the nitro group which blocks the cellular respiration of protozoans. Trimethoprim sulfadiazine inhibits folate synthesis and metabolism. Ponazuril is effective against schizonts and gametes by inhibiting nuclear division.

19. Which of the following ectoparasiticides is not effective in killing ticks? a) Fipronil b) Rotenone c) Amitraz d) Imidacloprid e) Permethrin

The answer is D. Imidacloprid is effective against fleas but not ticks. The other three ectoparsiticides are effective in killing both fleas and ticks.

VIII. Answer the following:

1. Classify Antinematodal drugs with examples**:**

I.Benzimidazoles: a)Benzimidazoles-albendazole, thiabendazole b) Pro-benzimidazole- febantel, thiophanate.

I I. Macrocyclic lactone; a) Avermectins-ivermectin, abamectin. b) Milbemycin- milbemycin oxime, moxidectin.

III. Imidazothiazoles-levamisole, tetramisole.

IV. Tetrahydropyrimidines- pyrantel, oxantel.

V. Organophosphorus compounds-dichlorvos, trichlorfon

VI. Piperazines-piperazine, diethyl carbamazine.

VII. Arsenicals-thiacetarsamide, arsenamide.

VIII. Substituted phenols and salicylanilides- disophenol, closantel

. IX. Miscellaneous – Phenothiazine, Hygromycin B.

2.lassify anti cestodal drugs with examples:

classified in to 3 classes.

I.Synthetic organic compounds a)Isoquinolones-praziquantel, epsiprantel. b)salicylanilides-niclosamide. c)substituted phenols- dichlorophen, nitroscanate. d) benzimidazoles-Albendazole. e)miscellaneous-bunamidine.

II. Natural organic compounds-Kamala.

III. Inorganic compounds- lead arsenate.

3. Classify anti trematodal drugs with examples:

I.substituted phenols—nitroxynil, hexachlorophene.

II. Salicylanilide—closantel, rafoxanide.

III. Aromatic amide—diamphenethide

. IV. Sulphonamide—clorsulon.

V. Halogenated hydrocarbon-hexachlorethane.

VI. Benzimidazoles—albendazole, fenbendazole.

VII. Isoquinolones—praziquantal.

4. Classify antiprotozoal drugs with examples:

.I. Thiamine antagonist—Amprolium.

II. Ionophores/polyether antibiotics. monensin, salinomycin.

III. Folic acid antagonist-a) Sulphonamides—sulphaquinoxaline, sulphaguanidine .b) Pyrimidines—trimethoprim, ormethoprim. c) substituted benzoic acid-ethopabate.d) potentiated sulphonamide-trimethoprim +sulphadiazine.

IV. Quinolones—decoquinate

V. Pyridinoles—clopidol.

VI.Guanidines-robenidine.

VII. Nitrobenzamides—dinitolmide.

VIII. Carbanilides—nicarbazine

. IX. Quinazolines—halofuginone

.X. Benzene acetonitriles—diclazuril

. XI. Triazinones—toltrazuril.

XII. Benzyl purines—arprinocid.

XIII. Miscellaneous—nitrofurans, furazolidone, oxytetracycline.

5.Classify antipyroplasmic drugs with examples:

Pyroplasma include Babesiasis, theileriasis,cytauxzoonosis. They are seen in RBC, and Histocytes.

I. Diamidine derivatives-Carbanilide diamidine- Imidocarb., aromatic diamidine - Pentamidine.
II. Quinuronium compounds-Quinuronium sulphate,
III. Naphthoquinones-parvaquone

IV. Tetracyclins- oxytetracyclins.

V.Quinazolines-halofuginone.

VI. Dyes-trypan blue.

6. Classify anti trypanosomal drug with examples**:**

(seen in blood and some tissues)

I.Aromatic diamidines -diminazine.

II.Quinapyramine compound -quinapyramine sulphate.

III.Aminophenanthridium compound -homidium

IV.Carbamide derivative -suramin.

V.Antimonial compound -antimoney potassium tartrate.

VI. Dyes -trypan blue.

7. Classify antigiardial drug with examples:

I. Nitroimidazoles-metronidazole, tinidazole.

II. Benzimidazoles: Albendazole, Fenbendazole.

III. Nitrofurans-furazolidone

IV. Acridine derivatives-quinacrine.

8.Classify insecticides with examples**:**

I. Pyrethrins and pyrethroids-: Natural eg.pyrethrin, synthetic eg.fenvalerate.

II. Organo phosphorus compounds--Dichlorvos.

III. Carbamates-Carbaryl.

IV. Organochlorins-Gama benzene hexachloride.

V.Formamides-Amitraz

. VI. Chloronicotinyl insecticides-Imidaclopid.

VII. Phenyl pyrazole- Fipronil.

VIII. Botanical insecticides-Rotenone, linalool

.IX. Avermectin and milbemycin.

X. Miscellaneous-Benzyl benzoate.

XI.Insect growth regulators: a).Juvenile hormone analogues/ Juvenoids-methoprene, fenoxycarb. b). Chitin synthesis inhibitors-Lufenuron.

9.What are antiparasitic drugs: Drugs that reduce parasitic burden to a tolerable level by killing or inhibiting their growth.

10.What are the ideal characteristics of an antiparasitic agent? It should have broad spectrum of action, effective in removing mature and immature parasite from the body, wide therapeutic index- toxic dose must be three times greater than the therapeutic dose, economically justifiable, easy to administer eg. in feed-injection-pour-on etc., one dose treatment, no residue problem especially in food-producing animals, not interfere with normal physiological function of host.

11.What are the mechanism of action of antiparasitic agents? 1. Paralysis of the parasites by mimicking the action of putative neurotransmitters. 2) alterations in the membrane process. a) inhibition of microtubule synthesis b) inhibition of folic acid synthesis or metabolism c) inhibition of thiamine utilization d) uncoupling of oxidative phosphorylation e) inhibition of chitin formation in arthropods f) simulation of insect juvenile hormones 3) Alterations of parasite reproduction a) inhibition of replication of protozoans b) inhibition of egg production in nematodes.

12.Collies are highly sensitive to ivermectin why? In susceptible breeds have a mutation of P-glycoprotein particularly in the endothelial cells of the BBB. P-glycoprotein is a multi drug transporter found in the epical membrane of endothelial cells responsible for drug exit from the brain. The mutation cause retention of drug in the brain.

13.What happens if too much sulphaquinoxalin is added in the feed to treat coccidiosis? It looses the second generation schizont selectivity of - which is necessary for the antibody production- the same birds will get the infection again.

14..What is the mechanism of action of Benzimidazoles? It binds strongly to nematode beta tubulin- a structural protein necessary for the formation of viable microtubules-results in complete absence of microtubules in the intestinal cells -unable to absorb nutrients-starved. It inhibit mitochondrial fumerate reductase enzymes, blocking of glucose transport, uncoupling of oxidative phosphorylation.

15.2PAM should not be used to treat carbamate poisoning .Why?-Carbamate binding to Cholinesterae is reversible, 2PAM itself inhibits Cholinesterae in a reversible manner.

X.Write short notes on

1 Avermectin: are a group of closely related antibiotic isolated from soil microorganism *Streptomyces avermitilis* . They are highly potent and shows activity against a wide range of parasites from nematode to ectoparasitic arthropods. No action against tape worm and flukes. Chemically consist of 4 major component A1a, A2a,, B1a, and B2a . They act by binding to a special type of glutamate –gated chloride channel receptor in nerve cells - prevent propagation of action potential- paralysis.- Commonly used compounds are ivermectin, abamectin, doramectin, eprinomectin and selamectin.

2 Arthropod repellants: Are agents that repel insects, mainly flies-often added to insecticides for use on small animals, cattle, horse.-Dethyl toluamide is an odourless liquid often used as fly and mosquito repellent products . Can be applied as sprey. Butoxypolypropylene glycol is another one, Dimethyl phthalate and citronella oil are also used.

3.Anthelmintic resistance in large animals. Greater frequency of individuals in a parasitic population no longer respond to normal clinical dose of drug. Mechanisms include a) A change in molecular target –so that the drug no longer recognizes the target. b) Change in metabolism that remove the drug eg. up regulation of the P-glycoprotein exporter in the worm. c) A change in the distribution of the drug in the target organism-prevent drug from getting in to site of action. d) Amplification of target genes to overcome the drug action.

4.Blockade of drug resistance development in parasites? To reduce the development of resistance a) Avoid under dosing b) Use alternate anthelmintics with different mechanism of action c) Preferable to use short acting drug to prevent worms being exposed to sub therapeutic dose d) Well planned treatment/ management, access of free living stage to the next host should be reduced by removal of faeces and alternate grazing of different hosts. E) inherent nature of chemical- shows resistant to emerge faster than other drugs-avoid it.

5.Diflubenzuron: is an insect development inhibitor (IDIs) –inhibits the chitin synthesis in larva and eggs of insects. No effects on adult insects . Chitin is an important constituent of exoskeleton and egg shell. Used as feed additives in horse. Lufenuron administered orally in dogs and cats once a month inhibits development stages of fleas. Administered after food , also administered S/C once in every 6months in cats.

6. Anticoccidial drugs: A number of chemotherapeutic agents are used- Sulphadimidine in drinking water destroy second generation schizonts . Sulphaquinoxaline in drinking water or feed-generally used with other drugs like amprolium. Some strains may resist-continue for 5 days or intermittently on 3 day 2 day off basis. Too much dose loose the second generation selectivity which is necessary for the antibody production. Hence large amount cure the disease but again attack will happen. Pyrimidine derivative-Amprolium interfere with folic acid metabolism-is a thiamine antagonist prevent the development by its antianeurine action Nitrofurans -nitrofurazone. Vitamine K must be added to feed to reduce toxicity. Antibiotics like Aureomycin, spiramycin . Hetracyclic compounds like nicarbazine. Nitrofurans nitrofurazone. Quinolate group like clopidol.

7. Pyrethrins: are group of natural insecticides possess excellent knockdown properties and low mammalian toxicity, used as ectoparasiticides. Pyrithrines (Allethrin, Cypermethrin, Permethrin, Fenvalerate,) Pyrithrin is produced from extracts of pyrethrum(*Chrysanthimum*) flowers. Now natural

pyrithrines are replaced by synthetic compounds. Used against Fleas, Lice, Ticks, Mite,. Synthetic compounds are -more stable. Increase excitability of ectoparasite neurons by prolonging the opening of Na+ channels thereby causing arthropod paralysis- "Knockdown" effect.

8. Levamisole : It is the l-isomer of dl- tetramisole,- it has greater safety margin - commercially phosphate and hydrochloride salts are available-powder form –highly soluble in water so it can be used as injection- broad range of antinematodal activity in numerous animal species. –it stimulate autonomic ganglia and causes activation of parasympathetic and sympathetic nervous system –cause sustained muscular contraction and muscle paralysis. High dose will affect the carbohydrate metabolism also. It stimulate the non specific immune status in the host.

9. Insect growth regulators: Compounds that interfere with normal growth and development of insects. These mimics the natural insect hormone(juvenile hormone analogue) or prevent the formation of insect exoskeleton (chitin synthesis inhibitors) . These agents maintain persistently the larva in an immature stage and interfere with reproductive organ, differentiation. differs from traditional antiparasitic compounds. They are effective against pre-adult stage of insects and acarins. Their effect is usually seen after several days of use. safe to use in animals.they are used in poultry to control fecal maggots – sprayed on surface of manure. Methoprene and pyriproxyfen are sprayed in households and applied on animals to prevent eggs pupae and larvae from developing in to adult fleas.

10.Juvenile hormone analogue (Juvenoids): Methoprene, Cyromazine, Pyriproxyfen. Chitin synthesis inhibitors-Lufenuron, Diflubenzuron. (Explain insect growth regulators)

Flea control: For knock down (rapid killing of adult) Pyrithrin sprey, rinses or shampoos re effective —orally administered nitenpyran is good for use in animals over 4 weeks of age.-For rapid killing less than 24 hours of adult fleas with residual effects monthly application of fipronil, imidacloprid or selamectin in dogs and cats, metaflumizome in cats. Integrated flea control is the principle of applying multiple flea control products work in different manner (insect icide and insect growth regulator) fipronil + methoprene, permethrine + pyriproxifen. Niten pyran orally once weekly and receive monthly lufenuron as insect growth regulator.

Mite control: For dogs (sarcoptic infestation) selemectin and lime sulphur –other drugs include ivermectin ,amitraz, moxidectin, fipronil spreys and milbemycin oxime. For demodicosis of dogs –amitraz other products showing efficacy include ivermectin, moxidectin, milbemycin oxime. For demodicosis in cats –limesulfur rince. For notoderic mange in cats –ivermectin, selamectin, lime sulphur rinses.

For pediculosis (lice infestation): Doga and cats topical application of lime sulphur, pyrethrin, pyrethroid (for dogs only) , imidacloprid, fipronil spreys, cholinesterase inhibitors (for dogs only.)

Tick control: Fipronil pour on or sprays- permethrin pour on products (Dogs) and flea collars containing amitraz-selemectin has efficacy against some ticks

X.Write essays on.

1.Explain the insecticides used in animal practices.

2.Classify anti trematodal drugs, Explain drugs used against liver flukes .

3.Classify anti nematodal drugs give examples, explain the drugs used against strongyle infection.

4.What are anti cestodal drugs used in animal practice explain each one?

5.Classify anthelmintic with examples, what are the different mode of action .Explain any one drug used against blood parasites.

6.Explain the drugs used against pyroplasms.

7.Enumarate the different class of drugs used against ectoparasites give examples..Explain in detail the compounds used in animal practice.