Question paper 4
Autonomic N. system

I. Name the following:

1.Active ingredient of Ventolin/ Asthalin.-(Salbutamol)
2.Active ingredient of Dristan. -(Phenylephrine)
3.Active ingredient of Aldomet.- (Alpha methyl Dopa)
4.Acid (organic)which is used for the synthesis of parasympathetic transmitter.- (Acetic)
5.An inhibitor of Dopamine production from Dopa. -(Alpha methyl Dopa)
6.Alkaloid present in *Nicotiana tabacum*.- (Nicotine)
7.Among Catecholamines the most potent stimulator of beta receptor.-(Isoproterenol)
8.A drug causing anatomical peripheral sympathectomy.-(6- hydroxy dopamine)
9.A COMT inhibitor.- (pyrogallol)
10.Active ingredient of Medihaler.- (Isopreterinol, Phenylephrine)
11.Amino acid from which synthesis of Adrenaline starts.-(Phenylalanine)
12.A catecholamine depleting drug having tranquilizing action.- (Reserpine)
13.Active ingredient of Aldomet.- (Alpha methyl dopa)
14.Active ingredient of Isuprel. -(Isoproterenol)
15.Amino acid used for the synthesis of Adrenaline.- (Phenylalanine, Tyrosine)
16.Arrow tip poison used by tribals.-(Tubocurarine, Curare)
17.A selective stimulant of NM nicotinic receptor.-(Phenyl tri methyl ammonium, PTMA)
18.A selective blocker of NM nicotinic receptor.-(d-tubocurarine, Alpha bungarotoxin)
19.A synthetic chemical which will inhibit the synthesis of acetyl choline.- (Hemicholinium-chloride)
20.Choline esters other than Acetyl choline involved in neuronal transmission.- (Propionyl and Butyryl choline)
21.Chinese name of the plant from which Ephedrine is obtained.- (Mahuang)
22.Chemical mediator of sweat glands in Cattle.- (Acetyl choline)
23.Drug which will prevent the uptake of cytoplasmic Norepinephrine.- (Reserpine)
24.Drug that affect Nor adrenaline storage.-(Reserpine)
25.Drug that affect Nor adrenaline release.- (Guanethidine)
26.Drug that affect Nor adrenaline synthesis.-(Alpha methyl parta Tyrosine, Carbidopa, Alpha methyl dopa)
27.Enzyme necessary for the synthesis of Acetyl choline.-(Choline acetylase)
28.Ephedrine with less CNS action.-(Pseudoephedrine)
29.Fungi from which Ergot is obtained.- (*Claviceps purpurea*)
30.Inhibitor of production of Dopa from tyrosine.- (alpha methyl para tyrosin)
31.Liquid alkaloid having Ganglioe blocking action.-(Nicotine)
32.The post synaptic sympathetic receptors present in Thrombocytes.- (Alpha-2)
33.Methyl substitution at Beta position of carbamylcholine.- (Bethanechol)
34.Methyl substituted compound at Beta position of Acetyl choline.- (Methacholine)
35.Name few active principles present in Ergot.-(ergot alkaloids, histamine, acetyl choline, choline, betaine)
36.Name the active principles of *Atropa belladonna*.-(Atropine, Hyoscyamine,

Hyoscine)
37.Name two central muscle relaxant,.- (Mephenesin, Methocarbamol)
38.Scientist who proposed classification of adrenergic receptors in to Alpha and Beta.- (Ahlquist)
39.Serotonin antagonist - (Methysergide)
40.One Alpha 1 agonist.- (Phenylephrine)
41.One intracellular messenger of Adrenaline.- (cAMP, cGMP)
42.One alkaloid which inhibits the neuronal amine uptake.- (Cocaine)
43.One irreversible cholinesterase inhibitor.- (Organo phosphorus compound./Parathion)
44.One reversible cholinesterase inhibitor.- (Physostigmine, Neostigmine, Carbamates)
45.One drug of plant origin used in Organo phosphorus poisoning.-(Atropine)
46.One Alpha 2 adrenergic receptor agonist.- (Clonidine)
47.One Alpha 1 adrenergic receptor blocker.- (Prazosine)
48.One Alpha 2 adrenergic receptor blocker.- (Yohimbine)
49.One Beta 1 adrenergic receptor agonist.- (Dobutamine)
50.One Beta 2 adrenergic receptor agonist.- (Terbutalin, Salbutamol, Carbuterol)
51.One Beta 2 adrenergic receptor blocker.- Butoxamine)
52.One mixed alpha and Beta antagonist.-(Labetelol)
53.One organ where both sympathetic and parasympathetic stimulation is excitatory.- (Salivary glands)
54.One organ with striated muscles where inhibitory muscarinics receptors are present.- (Heart)
55.One serotonin antagonist.- (Methysergide)
56.One selective M_1 muscarinic receptor antagonist.-(Pirenzepine, Telenzepine)
57.One selective M_2 muscarinic receptor antagonist.- (Tri pitramine, Methoctramine)
58.One selective M_3 muscarinic receptor antagonist .-(Darfenacin)
59.One synthetic catecholamine.- (Isoproterenol, Orciprinaline, Dobutamine)
60.One non-catecholamine sympathomimetic alkaloid.- (Ephedrine)
61.One agent which blocks tyrosine hydroxylase.- (Alpha methyl tyrosine)
62.One muscle relaxant of plant origin. -(Tubocurarine)
63.One tranquilizer having alpha receptor blocking action.- (Chlorpromazine)
64.Other name for *Datura stramonium*.-(Pigweed, Jimson weed, Thorn apple, Devil's apple, Angel's trumpet.)
65.Organic acid necessary for the synthesis of transmitter at the adrenal medulla.- (Acetic acid)
66.Indirectly acting sympathomimetics.- (Amphetamine,. Tyramine)
67.Plant from which Tubocurarine is obtained.-(*Chondrodendron tomentosum*)
68.Plant from which Ordeal bean is obtained.- (*Physostigma venenosum*)
69.Plant from which Ephedrine is obtained.- (*Ephedra senica*, Mahuang *E. vulgaris*,)
70.Plant from which Physostigmine is obtained.- (*Physostigma venenosum*)
71.Plant from which Pilocarpine is obtained.-(*Pilocarpus jaborandi*)
72.Plant from which Yohimbine is obtained.- (Yohimbehe)
73.Plant from which Reserpine is obtained. -(*Rauwolfia serpentina*)
74.Plant from which Nicotine is obtained.- (*Nicotiana tabacum*)
75.Plant from which Arecoline is obtained.- (*Areca catechu*, Betel nut tree)
76.Part of autonomic nervous system in which post ganglionic fibers are longer.- (Sympathetic)
77.The other names of autonomic nervous system . -(Involuntary, Vegetative, Visceral.)

78.The longest Parasympathetic nerve in the body. -(Vagus.)
79.The other name for parasympathetic nervous system-(Cranio- sacral, Cholinergic)

II.State True or False. Correct the false statement by minimum change in the underlined portion.

1.Acetyl choline reduces the heart rate but no reduction in force of beat.- (T)
2.Acetyl choline causes constriction of bronchi.- (T)
3.Acetyl choline is more potent than Muscarine.- (F, less)
4.Acetyl choline is not therapeutically used because of high potency.- (F, low stability)
5.Acetyl choline have poor penetrability of Blood Brain Barrier .-(T)
6.Adrenaline causes contraction of spleen and put more blood in to circulation.- (T)
7.Adrenaline causes relaxation of sphincture muscles.-(F, constriction)
8.Adrenaline is contra indicated with Digitalis.- (T)
9.Adrenaline is not advisable in Hyperthyroidism. -(T)
10.Adrenaline is active orally.-(F, not active)
11.Adrenaline stimulates Insulin secretion.-(F, inhibits)
12.Adrenaline stimulate gluconeogenesis and glycolysis.- (T)
13.Adrenergic axon terminals contain Muscarinics and Nicotinic receptors also.- (T)
14.Alpha 2 agonist reduces insulin release especially in ruminants.- (T)
15.Alpha 2 agonists reduces G.I.motility and secretions.-(T)
16.Alpha methyl dopa blocks the conversion of DOPA to Dopamine.- (T)
17.Alpha methyl para tyrosin blocks the conversion of tyrosine to Dopa.- (T)
18.Alpha methyl para tyrosin blocks the conversion of Dopa to Dopamine).-(F) tyrosine to Dopa
19.Among α_2 agonist ,Meditomedine causes greater sedation.- (T)
20.Among α_2 agonist Romifidine and Detomidine causes least sedation.- (T)
21.Amphetamine is active orally.- (T)
22.Amphetamine(*l*- form) is having more presser action . -(T)
23.Amphetamine (*l* -form) inhibits MAO centrally .- (T)
24.Asthalin is a β_2 stimulant. -(T)
25.Autonomic nerve system is absolutely essential for the action of various organs.- (F, not essential).
26.Alpha methyl DOPA is available as Aldomet.- (T)
27.Alpha 2 receptors are seen in post junctionally also on some CNS neurons.- (T)
28.Alpha methyl DOPA will act as a false neurotransmitter.- (T)
29.Alpha methyl DOPA is not destroyed by MAO.- (T)
30.Arecoline hydrobromide can be used to stimulate rumen.- (T)
31.Arecoline hydrobromide can be used as a Taeniacide. -(T)
32.Atropos is the name of a Greek God, who cut the thread of life.-(T)
33.Atropine is ½ potent than *l*- hyoscyamine.- (T)
34.Atropine is more stable than either *d* or *l* form of Hyoscyamine that is why it is preferred for treatment.-(T)
35.Atropine will block only the muscarinics effect.- (T)
36.Atropine is a mixture of *d*- and *l*-Hyoscyamine.-(T)
37.Atropine blocks the sensory buds on skin.- (T)
38.All doses of Hyoscine depress CNS.- (T)

39.All types of **β** adrenoceptors stimulate adenyl cyclase there by increase c AMP in the Cells.- (T)
40.Atropine reduce intestinal spasm and reduce pain. -(T)
41.Atropine will dilate the bronchi.- (T)
42.Atropine poisoning causes St. Antony's fire.- (F, Ergot)
43.Atropine is given in massive doses as antidote in O. Phosphorus. poisoning.- (T)
44.Blood brain barrier can not be penetrated by Adrenaline.- (F, can penetrate)
45.Bethanechol is preferred over Carbachol in urinary bladder atony.- (T)
46.Belladonna ointment and plasters can be used to reduce pain.-(T)
47.Botulinum toxin prevent the release of Acetylcholine from the tip of axon.- (T)
48.Central muscle relaxants are more safer than Neuro muscular blocking agent,-(F, not safer)
49.Canal of Schlemen is opened by atropine .- (F, blocked.)
50.Catecholamines have primarily direct action on effector organs. -(T)
51.Change in body colour (eg.Chameleon)is mediated through Adrenaline.-(T)
52.Cocaine inhibits the neuronal amine uptake.- (T)
53.Carbachol is contra indicated in pregnant animals. -(T)
54.Carbachol cause sweating in all animals except in Horse. -(F, in all animals)
65.Di isopropyl flurophosphate can be used in Myasthenia gravis.-(T)
56.*Datura stramonium* is called as Deadly night shade.- (F, Atropa belladonna)
57.Dextro form of Nor adrenaline is more powerful.-(F, Levo form)
58. *d* isomer of Hyoscyamine is inactive.- (T)
59. *d* isomer of Tubocurarine is less active than *l* isomer.-(F, more active)
60.Eventhough sweat glands are adrenergic in Horse acetyl choline causes sweating. -(T)
61.Epinephrine is a mixed **α** and ß agonist.- (T)
62.Epinephrine is contra indicated with Mercurial diuretics.-(T)
63.Ephedrine is having more intense and more prolonged pressor effect.- (T)
64.Ephedrine can be used as a mydriatic.- (T)
65.Epinephrine has no bronchodilator action.-(F)
66.Epinephrine can be used as a spray for its Decongestant action.- (T)
67.Ergot is an alkaloid obtained from Claviceps purpurea.-(F), is sclerotium of fungi)
68. Ergot is the sclerotium of the fungus Claviceps purpurea infecting Rye and other grains.-(T)
69.Facial and Glosso- pharyngeal nerve is a parasympathetic nerve.-(T)
70.Hallucination , excitation and mania can be produced by large doses of Atropine.- (T)
71.High dose of α_2 agonist may induce CNS depression.- (F, Excitation)
72.Hyoscine is less potent as a mydriatic than atropine. -(F, more potent)
73.Hemicholinium chloride inhibits the synthesis of Acetyl choline .- (T)
74.Hexa methonium is not a ganglion blocking agent .-(F, is a ganglion blocking))
75.Inferior mesenteric ganglia is a sympathetic ganglia and it is located near the organ. -(F, away from the organ)
76.In adrenal medulla there is no post ganglionic fibers as such.-(T).
77.In atropinised animals injection of Acetyl choline stimulate the production of Adrenaline and produce sympathetic response.- (T)
78.In atropine toxicity body temperature will increase in all animals except few.- (T)
79.In atropine toxicity body temperature will not increase in Dogs.- (T)

80.In the treatment of synechia Pilocarpine alternate with Atropine is recommended .-(T).
81.In eye Atropine is more potent as a mydriatic than hyoscine.- (F,less)
82.In treating neuro-muscular diseases, along with Neostigmine Atropine also must be given to block muscarinis action.- (T)
83.Intravenous administration of Guanethidine produce triphasic response in blood Pressure-.(T)
84.In rumen atony Carbamyl choline can be used.- (T)
85.In multiparous animals Carbachol can be used to induce parturition. -(T)
86.In myasthenia gravis we can recommend para sympatho mimetics.-(T)
87.Lobeline is mostly used as a smoking deterrent.-(T)
88.Large doses of Acetyl choline is necessary for stimulation of Nicotinic receptors than to stimulate Muscarinic receptors.-(T)
89. Large doses of Acetyl choline stimulate Adrenal medulla.- (T)
90. Levo DOPA can be used to treat Dopamine deficiency in CNS .-(T)
91. *l*- form of Adrenaline is more active than *d* form.-(T)
92. Large doses of atropine depress C.N.S.- (F,stimulate)
93. l- isomer of Hyoscyamine is more active than *d* form.-(T)
94.Large doses of Atropine stimulate CNS.- (T)
95.Like Atropine, Scopolamine (Hyoscine) causes a reduction in heart rate. -(F, Unlike)
96.Lobeline is a parasympatho mimetic agent .-(F, lytic)
97.Muscarine is not destroyed by Acetyl cholinesterase and pseudo cholinesterase.- (T)
98.Magnesium will interfere with the release of Ach. From nerve terminals.- (T)
99.Methocarbamol is effective in reducing convulsions due to strychnine.-(T)
100.Mephenesin have better muscle relaxation than curare. -(F, less)
101.Most of the organs have parasympathetic and sympathetic nerve supply except few like adrenal medulla, pilomotor muscles and sweat glands.-(T).
102.Most of the non catecholamines have both direct and indirect action .- (T)
103.Muscarine is 100 times potent than Acetyl choline.-(T)
104.Muscarine is obtained from *Amanita muscaria*. -(T)
105.Neuro muscular blocking agents have narrow therapeutic index.- (T)
106.Nor epinephrine is a transmitter in the brain.- (T)
107.Nor adrenaline is having little action on $ß_2$ receptors.- (T)
108.Nicotinic cholinergic receptors produce excitatory response.- (T)
109.Nicotine will not be absorbed through intact skin.-(F, will be absorbed)
110.Neostigmine is having more prominent action on neuro muscular junction than cardiovascular system.-(T)
111.Neostigmine is not effective in antagonizing the neuro muscular blocking action of Streptomycin.- (T)
112.Oculo-motor nerve is a sympathetic nerve.- (F, para sympathetic.)
113.Organo phosphorus compounds have parasympatholytic action.- (F, parasymp.mimetic)
114.Oxime compounds partially reactivate the cholinesterase to perform its function.- (T)
115.Ordinarily action of sympathetic and para sympathetic system is antagonist.-(T)
116.Para sympatho mimetic alkaloids have only less action on Nicotinic site.-(T)
117.Para sympatho mimetics are contraindicated in spasmodic colic.-(T)
118.Physostigmine can be used to treat myasthenia gravis. -(T)

119.Pre synaptic α_2 receptors are found in adrenergic and cholinergic nerve Terminals.-(T).
120.Post synaptic α_2 receptors are found in blood vessels in CNS .-(T)
121.Pseudo cholinesterase can hydrolyze Cholinesterase.-(T)
122.Para sympathetic nerves originate from Midbrain , Medulla and Sacral region of spinal cord.-(T).
123.Phenylephrine is an α_1 stimulant and is used as a nasal decongestant.-(T)
124.Phytomotor muscles will be relaxed by Adrenaline.- (F, constricted)
125.Parkinson syndrome is a deficiency of Dopamine in the Basal ganglia.- (T)
126.Physostigmine is not advisable in myasthenia gravis.-(F, advisable)
127.Pilocarpine is a directly acting parasympatho-mimetic. -(T)
128.Pilocarpine increases the secretion of saliva .-(T)
129.Pilocarpine can be used to treat Atropine toxicity.-(T)
130.Pilocarpine stimulate the ganglia where Ach. is the mediator. -(F, cannot)
131.Physostigmine is a synthetic parasympatho mimetic.- (F, Alkaloid)
132.Romifidine can be given intravenously in Horse without much side effects.- (T)
133.Respiration is stimulated by Atropine when it is depressed due to narcotics.-(T)
134.Release of catecholamines from adrenal medulla is mediated by N_N receptors.-(T)
135.Scoline is a centrally acting muscle relaxant -(F, not)
136.Secretary chromaffin cells will act as post ganglionic fibers in adrenal medulla.- (T).
137.Single i/v injection of Adrenaline will act for 1 to 2 Hrs.-(F, 5 to 10 min.)
138.Smooth muscles are contracted by Adrenaline release.- (F, relaxed)
139.Small doses of Nicotine can stimulate both acceleratory and inhibitory mechanism of Heart.- (T)
140.Small doses of Nicotine blocks only parasympathetic ganglia.- (T)
141.Succinyl choline is not contraindicated in cattle.-(F ,Contra indicated.)
142.Succinyl choline is destroyed by plasma pseudo cholinesterase.- (T)
143.Succinyl choline causes an elevation of potassium ions in plasma.-(T)
144.Succinyl choline deplete the potassium ions from skeletal muscles.-(T)
145.There are directly and indirectly acting sympathomimetics, Tyramine is a directly acting sympathomimetic .-(F, indirectly)
146.The dose of curare need not be reduced with General anesthetics.- (F, need to be reduce)
147.The pre ganglionic fibers of sympathetic nervous system is myelinated .-(T)
148.The post ganglionic fibers of sympathetic nervous system is myelinated.- (F, non myelinated).
149.The action of Carbachol can be blocked completely by Atropine-(F, not)
150.The axon of the pre ganglionic cell passes peripherally and innervate effector organs- (F, post gang lionic).
151.The mediator of sweat glands is Acetyl choline except in Horse and Sheep.-(T).
152.Tyrosine hydroxylase convert Tyrosine to DOPA.- (T)
153.The metabolism of Adrenaline is very slow.-(F, Fast)
154.The inter-digestive secretion is reduced by Atropine.- (T)
155.Yohimbine is a glycoside from a plant Yohimbehe.-(F, Alkaloid)

III.Fill up the blanks with most appropriate words.

1.Acetylcholine is synthesized from Acetic acid and Choline with the help of an enzyme .....-(Choline acetylase).
2.Acetylcholine is hydrolised to Acetic acid and Choline by the enzyme .....-. (Acetyl choline esterase).
3.Acetyl choline is synthesized from .....-(.Vitamin).(Choline)
4.Adrenaline causes relaxation of .....uterus and contraction of..... uterus.- (non pregnant, pregnant)
5.Adrenaline and Nor adrenaline are destroyed by .....--(MAO).
6.Adrenaline solution is inactive when it become .....in color.- (Brown)
7.Adrenergic drugs are classified in to .....and.....-(Catecholamine - and non catecholamine)
8. *Alpha* $_1$ receptors are .....synaptic- (Post).
9. *Alpha* $_2$ receptors are .....synaptic- (Pre or post)
10. *Alpha* $_2$ receptors are .....in action- (Inhibitory)
11.As an α_2 blocker .....is desirable for non ruminants.-(Yohimbine)
12.As an α_2 blocker .....is desirable for ruminants.-(Tolazoline)
13.As an α_2 blocker .....can effectively be used in both ruminants and non ruminants.- (Atipamezole)
14.Alpha methyl Dopa is used as an .....blocking agent.-(Adrenergic neuron)
15.Alpha receptors are excitatory in nature except in .....-(Intestine)
16.All doses of Hyoscine will .....CNS.- (Supress)
17.α_2 receptors are ..... coupled receptors.- (Gi 10)
18.Arrow tip poison is obtained from .....-(*Chondrodendron tomentosum*)
19.Autonomic ganglia possess .....cholinergic receptors.-(Nicotinic)
20.Autonomic nervous system is divided in to .....and.....-(Sympathetic and Para- sympathetic)
21.Autonomic nervous system is otherwise called as .....-(Involuntary, Vegetative)
22.Arecoline is a parasympatho mimetic alkaloid from.....-plant(*Areca catechu*)
23.Atropine produce .....the pupil. -(dilatation of, mydriasis)
24.Atropine causes retention of urine and hence used to control .....of urine in -Dogs. (dribbling)
25.Atropine is a mixture of *l* -and *d*.....-(hyoscyamine.)
26.Atropine suppresses the sweating in all animals except .....-(Horse and Sheep)

27.Action of Tubocurarine can be blocked by .....-(Neostigmine)
28.Adrenaline is contra indicated with anesthetics like .....-(Cyclopropane)
29.Arecoline is available as .....-(Arecoline hydrobromide)
30.At the end of preganglionic fibers .....is the releasing material.- (Acetyl choline)
31.By adding .....we can prevent the oxidation of Adrenaline.-(Sodium bi sulphite)
32.*Beta 2* agonist can be used to treat .....-(Asthma)
33.*Beta 1* receptors are seen in .....muscles and β_2 receptors in .....-(Heart, -Bronchi)
34.*Beta 3* receptors are mainly present in..... tissue and are mainly responsible for lipolysis. -(Adipose)
35.Botulinum toxin prevent the .....of acetyl choline from nerve terminals.-(release)

36.Circulating Epinephrine is metabolized by .....-(COMT).
37.Circulating norepinephrine is destroyed by .....-(COMT)
38.Cleansing draught consist of Ext. .....liquidum, Mag.sulph and Tr.Zingiberis. -(Ergotum)
39.Catecholamines are stored in an inactive form with in the granules in .....nerve terminals.-(Adrenergic)
40.Dopamine receptor of vascular muscles is .....subtypes .-(D_{A1})
41.Dose of Atropine as a pre anesthetic is.....mg/kg.- (0.05)
42.Death due to Nicotine toxicity is by arrest of .....-(respiration)
43.Dichlorvos is a .....O.P. compounds and hence used in flea collars.-(Volatile)
44.Dopamine1 receptors are blocked by .....-(Haloperidol.)
45.The subtype of Dopamine receptors of vascular muscles is .....-(D_{A1})
46.The subtype of Dopamine receptors of peripheral sympathetic nerve is.....- (D_{A2})
47.The depressor effect of Dopamine is not blocked by Beta blockers but blocked by .....-(Haloperidol)
48.*l*-Dopa is available as..... and it is used in parkinsonism.- (Dopar)
49.Each nerve impulse release approximately ..... million molecules of Acetyl Choline -(Three)
50.Ergot is the .....of a fungi *Claviceps purpurea*.- (Sclerotium)
51.Ergot alkaloids are structurally related to .....-(Lysergic acid)
52.Ergotamine tartrate is used as a .....and it is available as Gynergen. -(Vasoconstrictor)
53.Ergometrine is used to stimulate .....-(uterus)
54.Ergometrine is otherwise called as .....-(Ergonovine)
55.Ergometrine mainly acts on ..... -(Uterus)
56.Ergot will blocks only .....receptors.-(Alpha)
57.Ephedrine is a .....mimetic amine present in *Ephedra senica* , *E. vulgaris*.-(Sympatho)
58.Ephedrine is contra indicated in cardiovascular diseases because of its powerful .....stimulation -(heart)
59.Ephedrine is mainly used in the treatment of.....-(Asthma)
60.Eserine is obtained from the plant .....-(*Physostigma venenosum*)
61.For Epistaxis .....(dilution) solution of Adrenaline in Normal saline is sprayed in to nostril. -(1 : 1000)
62.For the induction of vasoconstriction .....(dilution) solution of adrenaline is added to local anesthetics.- (1:100000)
63.For Intramuscular administration Epinephrine is used in a dilution of .....-(1:500)
64.For the treatment of hypersensitivity in Horse .....ml , 1:1000 solution of adrenaline s/c can be used.-(4-8 ml)
65.For the treatment of hypersensitivity in Dogs.....ml , 1:10000 solution of Adrenaline subcutaneously can be used.-(1-5 ml)
66.Gastro- intestinal tract motility and secretion is .....by Acetyl choline.- (increased)
67.Gastro intestinal muscle tone and.....is reduced by Atropine .- (motility)
68.Gallamine trithiodide is available as .....-(Flaxedil).
69.Heart posses .....adrenergic receptors -(Beta 1).

70.Heart possess .....parasympathetic receptors.-(Muscarinic)
71.Homatropine is not plant origin,it is a ..... parasympatholytic agent.-(Synthetic)
72.Hyoscine is otherwise called as .....-(Scopalamine)
73.Hyperglycemia produced due to adrenaline is mainly due to stimulation of ..... receptors and inhibition of .....secretion.-(Alpha, Insulin)
74.Hytoscine is more potent than .....as a mydriatic and cycloplegic agent.-(Atropine)
75.Hemicholinium chloride reduces the synthesis of acetyl choline in the nerve terminals by blocking the uptake of .....by nerve terminals.-(Choline)
76. In most tissues ß receptors elicit an inhibitory action except .....muscle.-(Heart).
77.In most tissues α_1 receptors elicit .....action except in intestine -(Excitatory).
78.Isoproterenol is .....times more potent than Epinephrine on Heart.-(10-20)
79.In Cardiac arrest .....(dilution) solution of Adrenaline is injected Intra cardially.-(1:10000)
80.Inhibitory Dopamine receptor of peripheral sympathetic nerve is .....-(DA2)
81.Indirectly acting Parasympatho mimetics inhibits ..... and hence have more duration of action. -(Acetyl cholinesterase)
82.In Heart .....(inhibitory/ excitatory)mechanism is more powerful. -(inhibitory)
83.In adrenal medulla .....will act as post ganglionic fiber. -(chromaphin cells)
84.In sympathetic nervous system the ratio between pre and post ganglionic fiber is .....-(more than one)
85.In sheep adrenaline causes .....of non pregnant uterus and .....of pregnant uterus. -(Contraction, Relaxation of)
86.Inside the nerve terminals catecholamines are mainly metabolized by .....-(MAO)
87.Large doses of Atropine will .....-CNS.(Stimulate)
88.Lobeline is obtained from the plant.....-(*Lobelia inflata*)
89.Local anesthetics are not destroyed by choline esters however, local anesthetics with ester linkages can be hydrolysed by .....-(Pseudo cholinesterase)
90.Most of the organs have sympathetic and parasympathetic supply except ....., ... and .....-(adrenal medulla, pilomotor muscles , sweat glands)
91.Muscarinic receptors are excitatory in nature except in .....-(Heart muscles).
92.Muscarine is obtained from a mushroom .....-(*Amanita muscaria*)
93."Myanesin " contain the active ingredient .....-(Mephenesin)
94.Muscarine is an alkaloid present in .....-(Amanita muscarina)
95.Mediator of post gang ionic sympathetic nerve endings of sweat glands and hair follicle (except few animals) is .....-(Acetyl choline)
96.Neuromuscular junction possess .....cholinergic receptors.- (nicotinic)
97.Nicotinic receptors are of mainly two types namely.....& .....-(N_M, N_N)
98.N_M nicotinic receptors are seen at skeletal muscle end plate and mediate Skeletal muscle .....-(contraction)
99.Nor adrenaline is otherwise known as .....-(Levarterenol)
100.Nor adrenaline and Adrenaline are equipotent on .....receptors. -(β_1)
101.Nor adrenaline is slightly less potent than Adrenaline on .....receptors.-(Alpha)
102.Non depolarizing and Depolarising muscle relaxants will not give additive effect as they are.....-(antagonist)

103.Nicotine is obtained from .....-(*Nicotiana tabacum*)
104.N_N receptors are stimulated by dimethyl phenyl piperazinium.- (DMPP) and blocked by .....-(Hexamethonium and Trimetaphen)

IV.Choose the most appropriate answers from the given ones.

1.Acetyl choline is having a)cardiac inhibition b) vaso dilation c)Skeletal muscle stimulation d) all the above- (d)
2.Acetyl choline is not used therapeutically because a) not available in market b) very short duration of action c) no selective therapeutic response on various tissues d) None of the above -(b and c)
3.Acetyl choline produce vasodilatation by a) Inhibition of the release of nor epinephrine from the sympathetic nerve terminals by activating M_2 receptors. b) Interaction with M_3 receptors on the endothelial cells to release Nitric oxide which initiate the relaxation of vascular smooth muscles. c) Both the above.d) Direct relaxation.-(c)
4.Alpha 2 adrenergic receptors activation in CNS causes a) Analgesia b) Sedation c) Sk. muscle relaxation d) All the above. -(d)
5.Alpha receptors are seen in a) Blood vessels b) Radial muscles of Eye c) Gastro intestinal tract d) Spleenic capsules e) all the above- (e)
6.Among catecholamines the most potent stimulator of β_1 receptor is a) Adrenaline b) Nor adrenaline c) Isoproternol d) None of the above.-(c)
7.Autonomic nervous system a) have an intrinsic mechanism which enable it to act automatically. b) not absolutely essential for the action of various organs c) necessary for co-ordinate integrated action d) the centers are located in hypothalamus e) all the above are correct.- (e)
8.Atropine a) reduce milk secretion b) reduce salivary secretion c) mydriasis d) increase temperature e) all the above.-(e)
9.β_2 receptors are located on pre-junctional neuronal membranes and post junctional membrane of target organs like a) Blood vessels of skeletal muscles b) Liver c) Bronchi d) Uterus e) Intestine f) All the above- (f)
10.Carbachol is contra indicated in a) spasmodic colic b) intestinal obstruction c) pregnancy, d)All the above.- (d)
11.Dopamine is the major neurotransmitter in the following regions. a)Basal ganglia b)Limbic system c) Chemoreceptor trigger zone d) All the above.- (d)
12. d-tubocurarine is not commonly used in small animal practice because of it's a)Histamine releasing action b) Ganglion blocking action c) None of the above d) Both the above -(d)
13.Examples for Catecholamines are given below a) Dopamine b) Adrenaline c) Nor Adrenaline- (a,b, c)
14.Following organs have only sympathetic supply.- a) Most blood vessels b) Sweat glands c) Hair follicle d)All the above - (d)
15.Following organs have only parasympathetic supply. a)Ciliary muscles b) Gastric glands c) Pancreatic glands d) All the above -(d)
16.Following order of ranking is correct, about the potency of action on β receptors a)Isoprenalin ,Adrenaline, Nor adrenaline b) Nor adrenaline ,Isoprenaline, Adrenaline c) Adrenaline, Isoprenaline, Nor adrenaline -(a)
17.Following are choline neurotransmitters in the CNS. a) Acetyl choline b)Butyl choline c) Propionyl choline d) None of the above- (a,b,c)

18.Following organs receive only sympathetic division of nervous system.
a) Most blood vessels b) Sweat glands c) Hair follicle d)All the above - (d)

V.Match each one in A to all the matching ones in B and C

1.Ergot	*Rauwolfia - serpentina* (5)	To test the guilt of - a criminal (9)
2.Bretylium	St.Antonys fire (1)	Stored in granules (3)
3. α methyl dopa	Antipyretics (5)	Prevent release of NA (2)
4.MAO inhibitors	Quarterinary ammonium-compounds (2)	Prevent the uptake of - catecholamines (5)
5.Reserpine	False neurotransmitter (3)	Tinglings of hands (1)
6.Glaucoma	Tyramine (4)	Tranquilizer (5)
7. Nicotine	Tropical America (6) (12)	Synechia (12) (9)
8.Arecoline	Calabar bean (9) (6)	Cheese (4)
9. Eserine	Germans (10)	Ordeal beans (9) (6)
10.Nerve gas	Oxime compounds(11) (10)	Pralidoxime (11) (10)
11.Protopam	Taeniacide (8)	Pilocarpine (6) (12)
12. *Pilocarpus jaborandi*	*Physostigma venenosum* (9) (6)	South Africa (9) War gas (10) *Areca catechu* (8)

VI.Answer the following

1.What is uptake I and II?--- Uptake I is active uptake of the drug in to the presynaptic sympathetic nerve terminals, uptake II is the uptake in to the effector cells.

2.What are adrenergic drugs? ---Drugs that produce physiological response similar to those evoked by Epinephrine and Nor epinephrine are known as adrenergic drugs.)

3.Adrenaline is used to test the pituitary adrenal axis. How?--When adrenaline is injected hypothalamus is stimulated which in turn causes the release of ACTH which produce leucopenia if the axis functions well.

4.Differentiate Thoraco- lumbar and Cranio-sacral division of Autonomic nervous system--

Thoraco-lumbar	**Cranio- sacral**
Pre ganglionic fibers are short	Long.
Ganglia is located far from the organ	Located in, on or near the organ
Ratio between pre and post ganglionic-fibers are more than one.	Ratio is generally 1:1
More generalized and intense effect	Action is more localized.
The releasing substance in the pre-ganglionic terminal is Ach and post-ganglionic terminal is Adrenaline or-Nor adrenaline.	The releasing substance at the pre and post ganglionic fiber is Ach.

5.What happens to the following organs when Sympathetic and Parasympathetic division is stimulated?

Organs	**Sym.Stimulation**	**Para.Sym.Stimulation**

Heart	Stimulation ($ß_1$)	Suppression
Sk. muscle Blood vessels	Dilate($ß_2$)	.....
Bronchi muscles	Relax ($ß_2$)	Constrict
G.I.motility & tone	Relax(α and(ß)	Stimulate
Secretions	Reduce except saliva	All increase
Sweat glands	Stimulate in Horse &Sheep	Profuse
Urinary bladder	Wall relax	Constrict
Sphinctures	Constrict	Relax
Sex organs	Ejaculation	Erection
Saliva	Thick secretion increase	Thin secretion increase
Radial muscles of Eye	Pupil dilate	no action
Sphincture muscles of Eye	no action	Constrict pupil
Ciliary muscles	Relax, lens become less convex, distant vision	Constrict, more convex Near vision.
Blood vessels of skin,mucous membrane and viscera	Constrict (α)	Dilate

6.Classify Ergot alkaloids.
a) Ergotamine group-Ergotamine and Ergosine.
b) Ergotoxin group – Ergocrystine and Ergocryptine.
c) Ergobasine group-Ergometrine (Ergonovine)

7.Classify Adrenergic blocking drugs.
a) Adrenergic blocking –(Alpha and Beta blockers)
b) Adrenergic neuron blocking
c) Catecholamine depleting agent.
d) miscellaneous

8.What are Adrenergic blocking agents? Agents which interact with adrenergic receptors and not allow adrenergic agents to attach to receptors. Eg. Ergot alkaloids, Yohimbine

9.What are Adrenergic neuron blockers? Adrenergic neuron blocking agents are otherwise called as catecholamine depleting drugs. Impair the functions of post ganglionic sympathetic nerve-prevent the release of N.E. not blocks the receptors-hence respond to directly acting sympatho mimetics are not affected.Eg. Bretylium, Guanethedine, Reserpine.

10.Patients those who are using MAO inhibitors as antidepressants, cerebro-vascular accidents may happen when they take diet containing Cheese, Whine etc. Why? When MAO is inhibited high concentration of monoamine is available for release at nerve terminals. When indirectly acting amines like Tyramine which is present in Cheese, Whine etc. causes sudden release of high amount. of monoamines from terminals resulting in cerebro-vascular-accidents.

11.How catecholamines are metabolized? Inside the neurons catecholamines are metabolized by Mono amine oxidase(MAO) to deaminated metabolite. Outside the

neurons it is metabolized by Catechol O- methyl transferase (COMT) to normetanephrine.

12. What are cholinomimetic drugs? Group of drugs which will imitate the effect of Acetyl choline without any dinstinction to any particulat part of the body.

13. What are parasympatho mimetics? Agents which produce Acetyl choline like effect on effector cells innervated by parasympathetic nerve.

14. Classify parasympatho mimetic drugs.1) Act by direct stimulation of effector cells, a)Choline derivatives-Acetyl choline, Bethanecol, Carbachol. b) Natural alkaloids-Arecoline, Pilocarpine, Muscarine. 2) Act by inhibiting Acetyl choline esterase-causes the accumulation of Acetyl choline. a) Reversible-physostigmine, Carbamates, Neostigmine. b) Irreversible- organo phosphorus compounds.

15 What is Cleansing draught- used to remove the retained placenta and to helps in the involution of uterus. It consist of Extract. Ergot. Liquidum 10ml, Mag. Sulph 15gm, Tr. Of Zingiberis 30ml. For Cattle – 5-10 ml.

16.What are Nicotinic receptors? Stimulation of these receptors resembles the action of small doses of Nicotine on N.M.junction , Autonomic ganglia, Adrenal medulla-chromaffin cells. Action not blocked by Atropine but by hexamethonium.

17.What are Muscarinic receptors? Stimulation of these receptors resembles the action of Muscarine. CNS- M1 and M2, Autonomic ganglia-M_1, end organ –M_2, Stimulate smooth muscles and exocrine glands, Neuro effector junction of sympathetic nerve system that are cholinergic . Action blocked by Atropine.

18.Define Autonomic nervous system: Peripheral afferent and efferent nerve plexes and ganglia that modulate the involuntary activity of secretory glands, smooth muscles and visceral organs. It maintain respiration, heart rate, B.P, G.I.motility, urine output and all other visceral function.

19.What is 'Dales reversal' effect of adrenaline? It is a phenomenon in which there will be a reduction in blood pressure when Adrenaline is administered in to ergotomised animals instead of a rise in B.P. in normal animals. (Ergot will block Alpha receptors and only Beta receptors are acting)

20. What is Tachyphylaxis? Lack of response to repeated administration of drugs. (development of acute tolerance).Eg.Ephedrine- Causes the release of stored Epinephrine and Norepinephrine from nerve endings. Repeated used will deplete NE store and further use no action. New synthesis has to take place for further action which will take time.

21.What are Non depolarizing /Competitive N. M. blocking agents ? Agents combine with Nicotinic receptors in N.M junction and prevent binding of Ach to receptors-

hence they cause flaccid paralysis. Over action can be counteracted by increasing the concentration of Ach by using reversible cholinesterase inhibitors like Neostigmine.

22.What is Hoffers Atropine test ? This test is used to differentiate between Schizophrenia and other mental disorders. In Schizophrenic a dose of Atropine produce a reduction or no change in B.P. While a rise is seen in patients with other disorders.

23.'What is Twilight sleep'? It is condition in which there will be neither sleep nor awake. It is produced by the administration of Atropine with sedative analgesics like Morphine. It produce drowsiness with amnesia , mostly used in obstestrical cases.

24.After long treatment with β blockers it must discontinue very slowly .WHY? To prevent super sensitivity to β agonist (Upregulation)or antagonist induced receptor sensitivity.

25.What is Epiphylaxis-Stimulation of phylaxis by drugs. Phylaxis is the normal defence mechanism of the body.

26.Classify adrenergic blocking drugs--1). Adrenergic blocking 2)Adrenergic neuron blocking 3) Catecholamine depleting agent 4) Miscellaneous.

27.What is "St. Antony's fire"-It is Ergot poisoning in human beings. On consumption of infected grains for a period, toxic signs begins. The symptoms will be tingling of the hands and feet , burning sensation of the limbs, gangrene of the digits and blackend like charcoal said to be consumed by the Holy fire . The name being in honor of Saint at whose shrine relief was said to be obtained – When affected people will move in mass to the land of St. Antony-stay and pray - get relief when they get un infected food in the land of St. Antony

28.In long duration treatment with adrenergic agonist body become refractory to bronchodilator action. Why? How we can overcome it? Because of down regulation of β_2 pulmonary receptor population body become refractory, Concurrent use of adrenergic agonist with Methyl xanthines will prevent this

29.What are repartitioning agents? Agents which are used as feed additives to improve rate of weight gain and feed efficiency, and to improve carcass leanness. Eg. Rectopamine , Zilpaterol

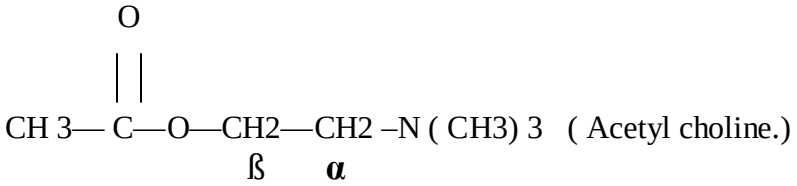
30.What is the difference between adrenergic blocking and adrenergic neuron blocking agents?Adrenergic blocking agents? They interact with adrenergic receptors and not allow adrenergic agents to attach to receptors. Eg. Ergot alkaloids, Yohimbine Adrenergic neuron blocking agents are otherwise called as catecholamine depleting drugs. Impair the functions of post ganglionic sympathetic nerve-prevent the release of N.E.-not blocks the receptors-hence respond to directly acting sympatho mimetics are not affected.Eg. Bretylium, Guanethedine, Reserpine.

VI.Write short notes on.

1.Carbamyl choline---Synthetic white crystals- water soluble-1: 10000 sol. For small animals, 1: 1000 sol for large animals, s/c route-highly potent- repeated small doses are preferred than large single dose-have nicotinic and muscarinics action- atropine partially blocks the action-slow hydrolysis- more action on G.I.tract, urinary bladder, intestine, rumen- can be used in rumen impaction.

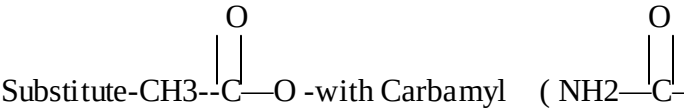
2.Uses of Atropine--- As a pre-anaesthetic, as a mydriatic, in synechia, as an antispasmodic, bronchodilator, Heaves in horses, to control enuresis, to relive spasm of uterus, to reduce frequency of urination in cystitis and dribbling of urine in dogs. In parkinsonism reduce muscle tremors, reduce stiffness,to differentiate between schizophrenia and other mental disorders, to induce "twilight sleep" (drowsiness with amnesia) .

3.Structure activity of Acetylcholine , Carbamyl choline and Bethanecol.--

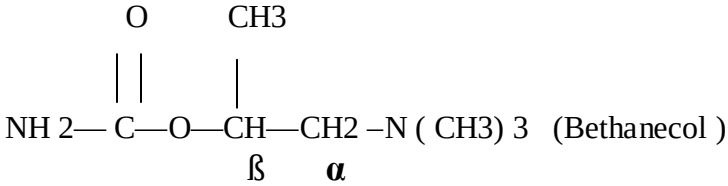


(Acetyl choline.)

Substitute CH3 group at ß give Acetyl ß methyl cholineb, Methacholine



Substitute CH3 group to ß of Carbamyl choline get carbamyl ß methyl choline-Bethanecol



(Bethanecol)

Explain the activity of each.

4.Release of neuro transmitter: (Use the help of a diagram) --- Action potential arises at nerve terminals facilitate calcium influx –triggers the discharge of neuro transmitter from storage vesicles in to junctional cleft- react with receptor on post junctional membranes – initiate response

5.Classify alpha adrenergic antagonist with examples?---

1. Non selective alpha adrenergic receptor antagonist
   i. Halo alkylamine derivatives- Phenoxy benzamine and Dibenamine.
   ii.Imidazoline derivatives-Tolazoline and Phentolamine
   iii. Ergot derivative- Ergotamine, Dihydroergotamine
   iv.Miscellaneous- a) Neuroleptics-Chlorpromazine, Haloperidol

b) Benzodioxan derivatives-Piperoxan
c) Dibenzazepine derivatives- Azapetine

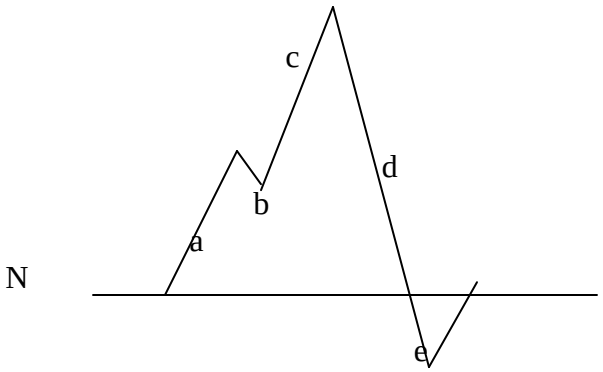
II. selective Alpha adrenergic receptor antagonists

i. Selective Alpha 1 adrenergic receptor antagonist.
   a) Quinazoline derivatives –Prazosine
   b) Indole derivatives-Indoramin
   c) Miscellaneous – Ketanserin

ii. Selective Alpha 2 adrenergic receptor antagonist.- Yohimbine, Atipamezole

..

6.The following curve represent the Blood pressure following the administration of Adrenaline. Explain the different part of the curve.



N represent the Normal blood pressure- a) shows the initial rise when adrenaline is administered mainly due to peripheral vaso- constriction, b) represent a momentary fall due to the reflex vagal stimulation to counteract the rise of B.P. c) Again a rise mainly due to stimulation of heart rate and force of beat, and peripheral effect. d) fall in B.P due to the metabolic destruction of adrenaline. e) below normal fall because the Beta receptors in skeletal muscles are still active as their threshold is very low . then return to normal when all are metabolized. At the initial phase the action of Beta receptors are overcome by alpha receptors and stimulation of Heart.

VII.ESSAYS

1.Explain in detail the storage , release, reuptake, metabolism, neuronal transmission and inhibitors at adrenergic neuro effector junction (with the help of a diagram).

2.Classify the autonomic nervous system –Explain the action of sympatho mimetics and sympatholytics on different body systems.

3.What is Atropine ? Explain its actions on different systems, uses,toxicity and treatment