

## Bihar Public Service Commission

Drug InspectorWritten (Objective) Competitive Examination (Advt.No. 09/2022)

**(Examination Date : 09.07.2023)**

### **PROVISIONAL ANSWER KEY :Pharmacology and Toxicology**

#### **(Paper-3, Unit II)**

आयोग द्वारा उपलब्ध कराये गये उत्तर पूर्णतः औपबधिक (Provisional) हैं। उपर्युक्त निर्धारित तिथि तक आपत्तिकर्ताओं से प्राप्त आपत्ति की गहन समीक्षा विषय विशेषज्ञों की समिति द्वारा की जायेगी और गहन समीक्षोपरान्त सभी प्रश्नों का अन्तिम आदर्श उत्तर तैयार किया जायेगा। विषय विशेषज्ञों की समिति द्वारा तैयार किये गये उक्त अन्तिम आदर्श उत्तर का आयोग द्वारा अनुमोदनोपरान्त उसके आधार पर ओ.एम.आर. उत्तर पत्रक (OMR Answer Sheet) का मूल्यांकन किया जायेगा।

Series-A		Series-B		Series-C		Series-D		Remarks
Question No.	Answer	Question No.	Answer	Question No.	Answer	Question No.	Answer	
1	D	12	A	27	B	42	C	Source- Introduction, Route of drug administration Book- Essentials of medical Pharmacology, KD Thirpathi 2007
2	D	13	A	28	B	43	C	Source- Introduction, Route of drug administration Book- Essentials of medical Pharmacology, KD Thirpathi 2007
3	B	14	C	29	D	44	A	Introduction, Route of drug administration Book- Essentials of medical Pharmacology, KDThirpathi 2007
4	C	15	D	30	A	45	B	Basic Principles of Pharmacokinetic and Pharmacodynamics, Basic and clinical pharmacology 10 <sup>th</sup> Ed, by Bertram G Katzung
5	B	16	C	31	D	46	A	Chapter 62, Basic and clinical pharmacology 10 <sup>th</sup> Ed, by Bertram G Katzung.
6	B	17	C	32	D	47	A	It contains 5g of Dextrose dissolved per 100 mL of water. It is an isotonic solution. Whereas Dextrose saline is a mixture of dextrose, sodium chloride, and water. It contains 5% dextrose and sodium chloride dissolved in water.
7	A	18	B	33	C	48	A	It contains 5g of Dextrose dissolved per 100 mL of water. It is an isotonic solution.
8	D	19	A	34	B	49	C	Ringer's lactate solution, or lactated Ringer's solution, is a type of isotonic, crystalloid fluid further classified as a balanced or buffered solution used for fluid replacement. Isotonic (0.9%) saline is the most classical of all infusion fluids. It consists of sodium chloride (NaCl) dispersed in sterile water at a concentration that makes the volume remain in extracellular fluid (ECF) space. The fluid is called isotonic.
9	A	20	B	35	C	50	D	Adrenergic System. Book- Essentials of medical Pharmacology, KDThirpathi 2007
10	B	21	C	36	D	1	A	Pharmacodynamics (Receptor). Book- Essentials of medical Pharmacology, KD Thirpathi 2007
11	C	22	D	37	A	2	B	Pharmacodynamics (Receptor). Book- Essentials of medical Pharmacology, KDThirpathi 2007
12	A	23	B	38	C	3	D	Acidification of urine using certain compounds such as NH <sub>4</sub> CL, methionine or ascorbic acids enhances the excretion of basic

Series-A		Series-B		Series-C		Series-D		Remarks
Question No.	Answer	Question No.	Answer	Question No.	Answer	Question No.	Answer	
								drugs. Alkalinisation of urine using citrates, tartarates, bicarbonates promote the excretion of acidic drugs
13	C	24	D	39	A	4	B	The normal corrected GFR is 80-120 mL/min/1.73m <sup>2</sup> , impaired renal function is 30-80 mL/min/1.73m <sup>2</sup> and renal failure is less than 10 mL/min/1.73m <sup>2</sup> .
14	C	25	D	40	A	5	B	Disintegration time of a drug will be a factor for drug absorption, it will not directly affect the dialysis rate.
15	D	26	A	41	B	6	C	An adverse drug reaction (ADR) can be defined as 'an appreciably harmful or unpleasant reaction resulting from an intervention related to the use of a medicinal product
16	C	27	D	42	A	7	B	Bioavailability is used to describe the fraction of the dose of drug administered that is present within the body and facilitates the desired physiological effects.
17	D	28	A	43	B	8	C	Parenteral route cannot be used in case of a unconscious patient.
18	B	29	C	44	D	9	A	Mydriatics are a type of medicine that make the pupil of the eye dilate (open up). Mydriatics also tend to relax the focusing muscles of the eye, which means that blurred vision is a common side effect.
19	C	30	D	45	A	10	B	Intra-articular (IA) injections directly deliver high concentrations of therapeutics to the joint space and are routinely used in various musculoskeletal conditions such as osteoarthritis (OA) and rheumatoid arthritis (RA)
20	B	31	C	46	D	11	A	When a drug given by the intravenous route, it will have an absolute bioavailability of 100% (f = 1), whereas drugs given by other routes usually have an absolute bioavailability of less than one
21	D	32	A	47	B	12	C	Intravenous dosing is considered 100% bioavailable since the drug is administered directly to the bloodstream, also termed the central compartment
22	D	33	A	48	B	13	C	Explanation: Mammillary model is the most common compartment model used in pharmacokinetics. This method has one or more peripheral compartments connected to the central compartment. The central compartment comprises of plasma and highly perfused tissue such as lungs, livers, kidneys, etc.
23	A	34	B	49	C	14	D	The <a href="#">International Day against Drug Abuse and Illicit Trafficking</a> , or World Drug Day, is marked on 26 June every year to strengthen action and cooperation in achieving a world free of drug abuse.
24	D	35	A	50	B	15	C	Peer Pressure, Adventure, A feeling of Excitement and Euphoria are common reason for Drug Abuse or Drug Dependence?
25	D	36	D	1	D	16	D	Slurred speech, Uncoordinated motor movements, Impairment in attention and memory are generally associated with

Series-A		Series-B		Series-C		Series-D		Remarks
Question No.	Answer	Question No.	Answer	Question No.	Answer	Question No.	Answer	
								Barbiturate and Benzodiazepine Abuse and Dependency, sedative intoxication
26	D	37	D	2	D	17	D	A long-term user of cocaine may leads to several long term health disorders such as <b>depression</b> , inability to socialize and many other psychological problems etc.
27	D	38	A	3	B	18	C	Drug interaction and their mechanism, Basic and clinical pharmacology 10 <sup>th</sup> Ed, by Bertram G Katzung.
28	A	39	B	4	C	19	D	Cirrhosis is a fatty acid condition that is commonly caused by alcoholism
29	D	40	A	5	B	20	C	Some athletes use diuretics to rapidly flush out the traces of other drugs such as anabolic steroids or amphetamine to qualify for participating in sport events
30	A	41	B	6	C	21	D	Cocaine binds to receptors of dopamine which are specialized proteins in neighbouring neurons and blocks the transport
31	A	42	B	7	C	22	A	Heroin, commonly called smack, is chemically diacetylmorphine which is a white, odourless, bitter crystalline compound. This is obtained by acetylation of morphine, which is extracted from the latex of poppy plant Papaver somniferous
32	C	43	D	8	A	23	B	Anaphylaxis is typically an IgE-mediated (type 1) hypersensitivity reaction that involves the release of numerous chemical mediators from the degranulation of basophils and mast cells after re-exposure to a specific antigen and cause reaction in the whole body.
33	D	44	A	9	B	24	C	Histamine released by mast cells activated by allergen in the skin causes large, itchy, red swellings of the skin
34	D	45	A	10	B	25	C	Watering of Eyes, Oedema, Sneezing are common manifestation of allergy?
35	B	46	C	11	D	26	A	Competitive antagonism occurs when a drug competes with another drug (agonist) for the same receptor sites on target cells. In a drug response curve, a competitive antagonist will cause a shift to the right in a non-parallel manner. This means that higher conc. of the agonists are needed to produce the same level of response that would have been achieved in the absence of the antagonist. The curve does not become parallel because the presence of competitive antagonist is affecting the binding of the agonist to its receptor, leading to a decrease in potency without changing the maximum response. This shift indicates reduced affinity of the agonist for its receptor due to the presence of antagonist.
36	C	47	D	12	A	27	B	Allergic reactions occur when an individual who has produced IgE antibody in response to an innocuous antigen, or allergen, subsequently encounters the same allergen (immune system)
37	B	48	C	13	D	28	A	The mean ( $\bar{X}$ ) = the average = 10 The variance ( $S^2$ ) = 4 The standard deviation ( $S$ ) = sqrt of variance = sqrt of ( $S^2$ ) = sqrt (4) = 2

Series-A		Series-B		Series-C		Series-D		Remarks
Question No.	Answer	Question No.	Answer	Question No.	Answer	Question No.	Answer	
38	A	49	B	14	C	29	D	Basic Principles of Pharmacokinetic and Pharmacodynamics, Basic and clinical pharmacology 10 <sup>th</sup> Ed, by Bertram G Katzung
39	C	50	D	15	A	30	B	The correlation coefficient computed for two parameters measured in 429 patients is $r = 0.829$ . This means that: a. The two parameters are inversely correlated, and the association is strong, r is negative and close to 1
40	B	1	C	16	D	31	A	The euphoric effect of drugs such as the opioids is due to increased release of dopamine- the dopamine reward pathways. Therefore drugs which increase the levels of dopamine in the synaptic cleft lead to increased activity. The physiological effects of dopamine are antagonized by the inhibitory neurotransmitter GABA, therefore drugs which inhibit the release of GABA into the synaptic cleft, such as diamorphine, also intensify the dopamine-induced feelings of euphoria resulting in addictive behavior.
41	A	2	B	17	C	32	D	Tachyphylaxis occurs when a medication suddenly provides a lessened response or benefit than it once did. Examples of medications that can cause tachyphylaxis include depression medications and eye drops that relieve redness or irritation
42	C	3	D	18	A	33	B	Amiodarone is also well known to interact with warfarin and cause prolongation of the prothrombin time due to its inhibition of the metabolism of both S-warfarin and R-warfarin. There are numerous reports of decreased warfarin dose requirements and increased INR related to the warfarin-amiodarone interaction
43	D	4	A	19	B	34	C	Phase I metabolism consists of <b>reduction, oxidation, or hydrolysis reactions</b> . These reactions serve to convert lipophilic drugs into more polar. Reference- Goodman & Gilman's: The Pharmacological Basis of Therapeutics, 14Edn by Laurence L. Brunton, Björn C. Knollmann (drug metabolism)
44	C	5	D	20	A	35	B	Phase II drug metabolising enzymes are mainly transferases. This review covers the major phase II enzymes: UDP-glucuronosyltransferases, sulfotransferases, N-acetyltransferases, glutathione S-transferases and methyltransferases (mainly thiopurine S-methyl transferase and catechol O-methyl transferase. Reference- Goodman & Gilman's: The Pharmacological Basis of Therapeutics, 14Edn by Laurence L. Brunton, Björn C. Knollmann (drug metabolism)
45	B	6	C	21	D	36	A	The aim of therapy in a diabetic patient is to alleviate symptoms and prevent long term complications and this is achieved by mimicking physiological release of insulin as closely as possible in order to control blood glucose levels. We therefore wish to prevent glucose levels falling too low

Series-A		Series-B		Series-C		Series-D		Remarks
Question No.	Answer	Question No.	Answer	Question No.	Answer	Question No.	Answer	
								(hypoglycaemia) and also blood glucose levels rising too high (hyperglycaemia). The BNF (section 6.1.1) recommends maintaining blood glucose between 4 and 9 millimole per litre
46	C	7	D	22	A	37	B	Type A reactions, which constitute approximately 80% of adverse drug reactions, are usually a consequence of the drug's primary pharmacological effect (e.g. bleeding when using the anticoagulant warfarin) or a low therapeutic index of the drug (Dose-related ADRs are particularly a concern when drugs have a narrow therapeutic index), and they are therefore predictable.
47	D	8	A	23	B	38	C	All medicines have the potential to cause adverse drug reactions (ADR) but the risk is greater for some medicines than others. In these scenarios we are not given the names of the medicines so it is difficult to take this into account. All patients are at risk of suffering from adverse drug reactions (ADR) but the risk of experiencing increases with age, number of medicines taken and the number of co-morbidities particularly those that impact on metabolism or renal function. In these scenarios the age of the patient is the key factor. The guidance on prescribing for the elderly in the BNF addresses the use of diuretics in the elderly
48	A	9	B	24	C	39	D	Potassium-sparing diuretics interact pharmacodynamically with the drugs such as ACE inhibitors, angiotensin receptor blockers, direct renin inhibitor, potassium supplements.
49	B	10	C	25	D	40	A	Idiosyncratic drug reactions, also known as type B reactions, are drug reactions that occur rarely and unpredictably amongst the population. This is not to be mistaken with idiopathic, which implies that the cause is not known
50	C	11	D	26	A	41	B	Type I allergy involves the IgE-mediated elaboration of inflammatory mediators such as histamine, heparin, tryptase, platelet-activating factor (PAF), and prostaglandins, which give rise to an inflammatory reaction.