

Chemistry in Everyday Life

Previous Years' Examination Questions

Practice the Real Questions

1 Mark Questions

- Nonadrenaline*
1. What is the cause of a feeling of depression in human beings? Name a drug which can be useful in treating depression.
[All India 2012]
 2. What is meant by 'narrow spectrum antibiotics'?
[Foreign 2012]
 3. State a reason of the following statements: The use of the sweetener aspartame is limited to cold foods and drinks.
[Foreign 2012]
 4. Define the following and give one example: Tranquilizers. *Equanil*
[Delhi 2012, 2006; All India 2010C]
 5. What is meant by a 'broad spectrum antibiotic'? *Chloramphenicol*
[Foreign 2011]
 6. What is tincture of iodine and what is it used for?
[All India 2011]
 7. Name the main constituents of dettol.
[Delhi 2010C]
 8. Describe the following types of substance, giving suitable examples: Antiseptics.
[All India 2010C; Delhi 2009]
 9. Write the name of an antacid which is often used as medicine.
[Foreign 2009]
 10. Name a substance that can be used as an antiseptic as well as disinfectant.
[Delhi 2008; All India 2008C]

2 Marks Questions

11. Describe and illustrate with an example, a detergent.
[All India 2012]
12. Name a food preservative which is most commonly used by food producers. *Nad*
[Delhi 2007]

13. Describe the following giving a suitable examples: antioxidants. *BH*
[Delhi 2006]
14. Differentiate between disinfectants and antiseptics. Give one example of each group.
[All India 2012]
15. What are biodegradable and non-biodegradable detergents? Give one example of each class.
[Foreign 2012; Delhi 2008]
16. Explain the cleaning action of soap. Why do soaps not work in hard water?
[All India 2012]
17. What are food preservatives? Name two such substances.
[All India 2012]
18. Explain the following terms giving an examples of each:
(i) Antacids [Delhi, Foreign 2011]
(ii) Sweetening agents
19. State the reason in each of the following cases:
(i) Soaps do not work well in hard water
(ii) Synthetic detergents are better than soaps
[Foreign 2011, 2009]
20. Explain the following terms with an example for each.
(i) Antifertility drugs
(ii) Antibiotics
[Delhi 2010; All India 2010C]
21. Explain the following with one example each.
(i) Anionic detergents
(ii) Chemotherapy
22. Name a broad spectrum antibiotic and state two diseases for which it is prescribed.
[All India 2009C; Foreign 2006]
23. What is meant by a broad spectrum antibiotic?
[Delhi 2008C]

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24. Discuss two ways in which drugs prevent the attachment of natural substrate on active site of an enzyme. [Delhi 2008C]
25. Mention one important use of each of the following: [Foreign 2007]
- (i) Equanil
 - (ii) Sucralose

3 Marks Questions

26. (i) Which one of the following is a food preservative?
Equanil, morphine, sodium benzoate
- (ii) Why is bithional added to soap?
- (iii) Which class of drugs is used in sleeping pills? [Delhi 2013]
27. (i) What class of drugs is ranitidine?
- (ii) If water contains dissolved Ca^{2+} ions, out of soaps and synthetic detergents, which will you use for clearing clothes?
- (iii) Which of the following is an antiseptic? 0.2% phenol, 1% phenol [All India 2013]
28. How do antiseptics differ from disinfectants? Name a substance that can be used as an antiseptic as well as a disinfectant. [All India 2012; Foreign 2010; Delhi 2008]
29. What are the following substances? Give one example of each one of them.
- (i) Tranquilizers
 - (ii) Food preservatives
 - (iii) Synthetic detergents [Delhi 2012]
30. Describe the following giving one example for each.
- (i) Detergents
 - (ii) Food preservatives
 - (iii) Antacids [All India 2011; Delhi 2011]
31. Explain the following terms with one suitable example for each.
- (i) A sweetening agent for diabetic patients.
 - (ii) Enzymes
 - (iii) Analgesics [Delhi 2011; All India 2009]
32. Answer the following questions.
- (i) Why do soaps not work in hard water?
 - (ii) What are the main constituents of dettol?
 - (iii) How do antiseptics differ from disinfectants? [Delhi 2011, 2009]
33. Mention the action of the following on the human body in bringing relief from a disease. [All India 2011C]
- (i) Bromopheniramine
 - (ii) Aspirin
 - (iii) Equanil
34. What are analgesics medicines? How are they classified and when are they commonly recommended for use? [Delhi 2010; All India 2010]
35. Explain the following terms with one suitable example in each case.
- (i) Cationic detergents
 - (ii) Enzymes
 - (iii) Antifertility drugs. [Delhi 2010]
36. Explain the following terms with one example in each case: [All India 2010; Delhi 2012, 2011]
- (i) Food preservatives
 - (ii) Enzymes
 - (iii) Detergents
37. Explain the following terms with example of each.
- (i) Cationic detergents
 - (ii) Broad spectrum antibiotics
 - (iii) Tranquilizers [All India 2010C]
38. Explain the following with one suitable example for each case.
- (i) Cationic detergents
 - (ii) Food preservatives
 - (iii) Analgesics [Delhi 2009]
39. What are the following substances? Give one example of each type.
- (i) Antacid
 - (ii) Non-ionic detergents
 - (iii) Antiseptics [Delhi 2009]
40. What are anionic detergents? How are they prepared? Write their two main uses. [Delhi 2009C]

41. What are artificial sweetening agents? Give two examples. Name the sweetening agent used in the preparation of sweets for a diabetic patient. [Delhi 2009C]
42. Mention one use of each of the following drugs. [All India 2008]
- Ranitidine
 - Paracetamol
 - Tincture of iodine
43. What are antibiotics? Distinguish between narrow spectrum and broad spectrum antibiotics. Classify the following into bactericidal and bacteriostatic antibiotics: Tetracycline, Penicillin. [All India 2008C]
44. (i) What are antipyretic medicines?
(ii) Name one of them.
(iii) Can it play any other role also? [Delhi 2007]
45. Given the structure of
(i) aspirin
(ii) paracetamol
(iii) chloroxylenol [Delhi 2006]
46. (i) Name one medicinal compound each that is used to treat
(a) Hypertension
(b) General body pain
(ii) Write the formal distinction between antiseptics and disinfectants. [Delhi 2008C]

Noradrenaline

Chloramphenicol

Step-by-Step Solutions

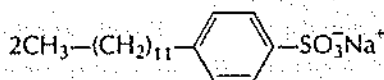
- Low level of noradrenaline is responsible for the feeling of depression in human beings. (1/2)
Iproniazid is a drug, used to counteract the effect of depression. (1/2)
- The antibiotics effective mainly against Gram-positive or Gram-negative bacteria are known as narrow spectrum antibiotics. e.g., penicillin G. (1)
- It is unstable at high temperature. (1)
- Tranquilizers Drugs reducing anxiety and produces a feeling of well being are know as tranquilizers. Example: Equanil. (1/2 + 1/2 = 1)
- Antibiotics which are effective against a large number of microorganisms are called board-spectrum antibiotics. e.g., chloramphenicol. (1)
- Iodine is a powerful antiseptic. Its 2-3% solution in alcohol-water mixture is known as tincture of iodine. Iodoform is also used as an antiseptic for wounds. (1)
- Chloroxylenol and α -terpineol. (1)
- Antiseptics These are the chemicals which prevent the growth of microorganisms. Examples Dettol, 0.2% solution of phenol (1/2 + 1/2 = 1)
- Rantidine. (1)
- Phenol, 0.2% solution of phenol is used as antiseptic while 1% solution of phenol is used as disinfectant. (1)
- Sodium or potassium salt of benzene sulphonic acid or sulphate unsaturated hydrocarbon of alkene type are called detergents. (1)
Examples sodium alkylbenzene sulphonate. (1)
- NaCl or common salt is used as food preservative. (2)
- Antioxidants are the chemicals which prevent oxidation and spoilage of food. Example butylated hydroxy anisole. (2)
- Antiseptics The chemicals which suppress the growth of microorganisms without affecting the tissues are called antiseptics. These are applied to wounds e.g., 0.2% solution of phenol, dettol. (1/2 + 1/2 = 1)
Disinfectants These chemicals also destroy the micro-organisms but are harmful for living tissues. They are used to clean floor, toilets, sick room etc., e.g., 2% solution of phenol, bleaching powder etc. (1/2 + 1/2 = 1)
- Detergents having straight hydrocarbon chains are easily decomposed by micro-organisms and are called biodegradable detergents e.g., sodium lauryl sulphate. (1/2 + 1/2 = 1)

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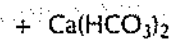
While detergents containing branched hydrocarbon chains are not easily degraded by micro-organisms and are called non-biodegradable detergents e.g., sodium 4-(1,3,5,7-tetramethylcyli) benzenic sulphonate.

$$(1/2 + 1/2 = 1)$$

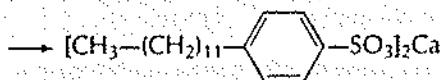
16. Soap has a hydrophobic part (hydrocarbon) that attracts dirt, grease oil etc., whereas hydrophilic part ($-\text{COONa}$) attracts water that take oil, dirt and grease. Soaps do not work well with hard because Mg^{2+} and Ca^{2+} ions of hard water react with soap to form magnesium and calcium salts of fatty acids, those are insoluble in water and form scum. $(1 + 1 = 2)$
17. Chemicals which prevent undesirable changes in flavour, colour, texture and appetitic appeal during storage are called food preservatives. Examples Sodium benzoate, NaCl $(1 + 1 = 2)$
18. (i) Antacids Substance those are helpful in removing the excess acid and raise the pH to appropriate level in stomach are known as antacids.
Example Milk of magnesia $[\text{Mg}(\text{OH})_2]$, rantidine (zantac) etc. (1)
- (ii) Sweetening agents Sucrose and fructose are artificial sweetening agents. (1)
19. (i) Refer to ans. 16. (1)
- (ii) Synthetic detergents work well with soft and hard water thus they are better than soaps. (1)
20. (i) Antifertility drugs Drugs those help in controlling the birth of the child are antifertility drugs. Example Progesterone, prystone. (1)
- (ii) Antibiotics These drugs kill or prevent the growth of bacteria and other microorganisms. Example Streptomycin. (1)
21. (i) Anionic detergents are sodium salts of sulphonated long chain alcohols or hydrocarbons. e.g., sodium lauryl sulphonate, $\text{CH}_3(\text{CH}_2)_{10}\text{CH}_2\text{OSO}_3\text{Na}^+$ (1)
- (ii) Chemotherapy The use of chemicals for therapeutic effect is called chemotherapy. (1)
22. Chloramphenicol is a broad spectrum antibiotic. It can be given for treating diseases like typhoid, dysentery, acute fever pneumonia, etc. (2)
23. Antibiotics which kill or inhibit a wide range of Gram-positive and Gram-negative bacteria are said to be broad spectrum antibiotics e.g., chloramphenicol, ofloxacin etc. (2)
24. The ways by which drug inhibit the attachment of substrate on active site of enzymes are
- (i) By competing with the natural substrate for their attachment on the active sites of enzymes. (1)
- (ii) By binding with allosteric site which changes the shape of the active site in such a way that substrate cannot recognise it. (1)
25. (i) Equanil It is a tranquilizer and is used to reduce anxiety and tension. (1)
- (ii) Sucralose It is an artificial sweetener and is of great value for diabetic patients who need to control intake of calories. (1)
26. (i) Sodium benzoate-food preservative. Morphine-narcotic analgesic Equanil-tranquillizer. (1)
- (ii) Bithional is added to soaps to reduce foams generating bacterial decomposition of organic matter on the skin, due to its antiseptic properties. (1)
- (iii) Tranquillizers are used in sleeping pills because they relieve stress fatigue by inducing sense of well-being. (1)
27. (i) It is an antacids as helps in removing acidity of stomach. (1)
- (ii) As the water contains dissolved Ca^{2+} ions therefore it is hard water. Hence, synthetic detergents are preferred over the soaps for clearing clothes because calcium salts of detergents are soluble in water while calcium salts of soaps are insoluble. As a result lot of soap is wasted. (1)



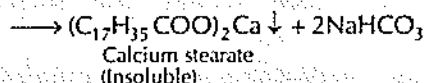
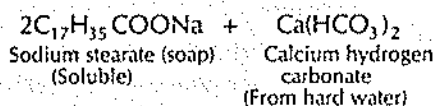
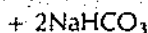
Sodium 4-(1-dodecyl)benzene sulphonate
(Synthetic detergent)



Calcium hydrogen carbonate
(From hard water)



Calcium 4-(1-dodecyl)benzene sulphonate
(Soluble in hard water)



(iii) 0.2% solution of phenol acts as antiseptic, whereas 1% solution of phenol acts as a disinfectant. (1)

28. Antiseptics are the chemicals that kill or prevent the growth of microorganisms. They can be applied to living tissues but disinfectants are harmful for living tissues, it kills microorganisms too. (1)

Phenol is used as antiseptic as well as disinfectant.

0.2% solution of phenol - antiseptic (1)

2% solution of phenol - disinfectant (1)

29. (i) Tranquilizers The chemical substances used for the treatment of stress, mild and severe mental diseases are called tranquilizer. e.g., noradrenaline. (1)

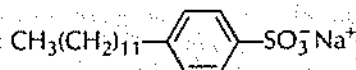
(ii) Food preservatives These are the chemical substances which are added to the food materials to prevent their spoilage and to retain their nutritive value for long periods. e.g., vinegar, sodium benzoate etc. (1)

(iii) Synthetic detergents These are cleansing agents which have all the properties of soaps but actually do not contain any

soap. These can be used both in soft and hard water. (1)

e.g., sodium p-dodecylbenzene-sulphonate.

30. (i) Detergents They are the sodium or potassium salts of sulphonic acids e.g., sodium alkylbenzene sulphonate i.e., sodium dodecyl benzene sulphonate. (1)

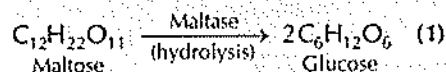


(ii) Food preservatives see ans. 29(ii). (1)

(iii) Antacids Substances which remove the excess acid and raise the pH to appropriate level in stomach are called antacids e.g., $\text{Mg}(\text{OH})_2$. (1)

31. (i) Sweetening agent for diabetic patients The chemicals that give sweetening effect to food but do not add any calorie to our body are called artificial sweetening agents e.g., aspartame, saccharin. (1)

(ii) Enzymes Various life processes which involve sequence of reactions occur in our body under very mild conditions. They occur in the presence of certain biocatalysts which are called enzymes. Almost all enzymes are globular proteins. e.g.,



(iii) Analgesics The chemicals which are used to relieve pain are called analgesics e.g., aspirin paracetamol, morphine etc. (1)

32. (i) Hard water contains calcium and magnesium ions, thus soaps form insoluble calcium and magnesium soaps when sodium or potassium soaps are dissolved in hard water and thus, separate out as scum. (1)

(ii) Refer ans. 7. (1)

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- (iii) Antiseptics are not harmful to living tissues while disinfectants kill micro-organisms and are not safe for living tissues. (1)
33. (i) Bromopheniramine acts as antihistamine (antiallergic). It interferes with the natural action of histamine by competing with histamine for binding sites of receptor where histamine exerts its effects. (1)
- (ii) Aspirin It is an analgesic, i.e., used to reduce pain and antipyretic, i.e., brings down the body temperature. (1)
- (iii) Equanil is used for controlling depression and hypertension. (1)
34. The chemical substances which are used to relieve pain are called analgesics. (1)
These are of two types
- (i) Non-narcotic drugs These are non-habit forming and effective in relieving or preventing heart attack, skeletal pain of viral inflammation. (1)
- (ii) Narcotic drugs These drugs produce sleep, unconsciousness and convulsions. These are habit forming drugs and are recommended for the relief in post operative pain, cardiac pain and terminal cancer. (1)
35. (i) Cationic detergents are quaternary ammonium salts of amines with acetates, chlorides or bromides as anions e.g., cetyltrimethyl ammonium bromide. (1)
- (ii) Refer ans. 31 (ii). (1)
- (iii) Antifertility drugs Drugs which are used to control birth rate are called antifertility drugs. e.g., novestrol, norethindrone. (1)
36. (i) Refer ans. 30 (ii). (1)
- (ii) Refer ans. 31(ii). (1)
- (iii) Refer ans. 30 (i). (1)
37. (i) Cationic detergents Refer ans. 35 (i). (1)
- (ii) Broad spectrum antibiotics Refer ans. 5. (1)
- (iii) Tranquilizers Refer ans. 4. (1)
38. (i) Refer ans. 35 (i). (1)
- (ii) Refer ans. 29 (ii). (1)
- (iii) Refer ans. 31 (iii). (1)
39. (i) Antacid Refer ans. 30 (iii). (1)
- (ii) Non-ionic detergents Some detergents like esters of high molecular mass, formed by reactions between polyethylene glycol and stearic acid, are called non-ionic detergents e.g., $\text{CH}_3(\text{CH}_2)_{16}\text{COO}(\text{CH}_2\text{CH}_2\text{O})_n\text{CH}_2\text{CH}_2\text{OH}$ (1)
- (iii) Antiseptics Refer ans. 14. (1)
40. Anionic detergents are sodium salts of sulphonated long chain alcohols or hydrocarbons. (1)
- When long chain alcohols are treated with concentrated sulphuric acid, they give alkyl hydrogen sulphates of high molecular mass and finally the alkyl sulphates are neutralised with alkali to form salts (i.e., detergents). (1)
- $$\text{CH}_3(\text{CH}_2)_{10}\text{CH}_2\text{OH} + \text{H}_2\text{SO}_4 \longrightarrow \text{CH}_3(\text{CH}_2)_{10}\text{CH}_2\text{OSO}_3\text{H}$$
- $$\xrightarrow{\text{NaOH}} \text{CH}_3(\text{CH}_2)_{10}\text{CH}_2\text{OSO}_3^- \text{Na}^+$$
- Sodium lauryl sulphonate
- Uses
- (1) They are used in toothpastes. (1/2 + 1/2 = 1)
- (2) They are used for cleansing purpose in acidic solutions.
41. The chemicals that give sweetness to the food but do not add any calorie to our body are called artificial sweetening agents. (1)
- e.g., saccharine, aspartame. (1/2 + 1/2 = 1)
- Any artificial sweetening agent like aspartame alitame etc., can be added to the food consumed by diabetic patient. (1)

42. (i) Ranitidine is used as an antacid. (1)

(ii) Paracetamol is used to bring down the body temperature during high fever i.e., as antipyretics. (1)

(iii) Tincture of iodine is used as an antiseptic. (1)

43. Chemical substances that are produced by microorganism and can inhibit the growth or even destroy other microorganisms are called antibiotics. (1)

The antibiotics that kill or inhibit a wide range of Gram-positive and Gram-negative bacteria are called broad spectrum antibiotics while antibiotics which are used against only for Gram-positive or Gram-negative bacteria are called narrow spectrum antibiotics. (1)

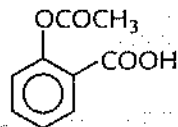
Penicillin (bactericidal) is a narrow spectrum antibiotic and tetracycline (bacteriostatic) is a broad spectrum antibiotic. (1)

44. (i) Medicines used to lower temperature of the body in case of high fever are called antipyretics. (1)

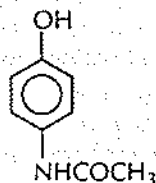
(ii) Paracetamol (1)

(iii) They can also play the role of analgesics i.e., relieve the body pains. (1)

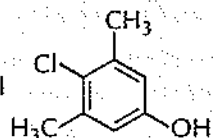
45. (i) Aspirin (1)



(ii) Paracetamol (1)



(iii) Chloroxylenol (1)



46. (i) (a) Equanil is used to reduce hypertension. (1)

(b) Aspirin is used to reduce body pain. (1)

(ii) Antiseptics have low concentration and can be applied to living tissues while disinfectants have high concentrations and are not safe to be applied to the living tissues. (1)