GPAT QUESTION PAPER 2004 WITH ANSWER KEY

PHARMACEUTICAL SCIENCE

Time : 3 hours **Maximum Marks : 150**

Read the following instruction carefully.

1. *This question paper contains 90 objective questions. Q. 1-30 carry 1 mark each and Q. 31-90 carry two marks each.*
2. *Answer all the questions.*
3. *Questions must be answered on special machine gradable Objective Response Sheet (ORS) by darken-ing the appropriate bubble (marked A, B, C, D) using HB pencil against the question number on the left hand side of the ORS. Each question has only one correct answer. In case you wish to change an answer, erase the old answer completely using a good soft eraser.*
4. *There will be NEGATIVE marking. For each wrong answer, 0.25 mark for Q. 1-30 and 0.5 mark for Q. 31-90 will be deducted. More than one answer marked against a question will be deemed as an incorrect response and will be negative marked.*
5. *Write your registration number, name and name of the Centre at the specified locations on the right half of the ORS.*
6. *Using HB pencil, darken the appropriate bubble under each digit of your registration number.*
7. *Using HB pencil, darken the appropriate bubble under the letters corresponding to your paper code.*
8. *No charts or tables are provided in the examination hall.*
9. *Use the blank pages given at the end of the question paper for rough work.*
10. *Choose the closest numerical answer among the choices given.*
11. *This question paper contains 20 pages. Please report, if there is any discrepancy.*

(Q. 1 - 30) CARRY ONE MARK EACH

1. The structural feature common for propranolol, atenolol, pindolol, metoprololin the side chain is
   (a) Isopropyl amino propan-2-ol (b) Dimethyl amino propan-2-ol
   (c) Diethyl amino propan-2-ol (d) Dibutylamino propan-2-ol
2. When N- methyl group of morphine is replaced with an allyl group, the compoundformed is
   (a) Naloxone-morphine antagonist (b) Naltrexone-morphine antagonist
   (c) Nalorphine-morphine antagonist (d) Nalbuphine-morphine agonist/antagonist
3. Nitrazepam can be synthesized from
   (a) 2-Bromo-5-amino benzophenone (b) 2-Nitro-2-chloro acetophenone
   (c) 2-Amino-5-nitro cyclohexanone (d) 2-Amino-5 nitro-benzophenone
4. Clavulanic acid has a beta lactam ring fused to
   (a) Thienyl system (b) Thiodiazole system
   (c) Thiazolidine system (d) Oxazolidine system

5. A drug which has antipyretic, anti-inflammatory and antiplatelet activity is

(a) Sulfinpyrazone (b) Aspirin

(c) Ticlopidine (d) Acetaminophen

6. Wild cherry bark contains prunasin which is a

(a) Phenolic glycoside (b) Isothiocyanate glycoside

(c) Coumarin glycoside (d) Cyanogenic glycoside

7. Ephedra sinica and *Ephedra equisetina* can be distinguished by type of

(a) Branching (b) Stomata

(c) Scaly leaves. (d) Alkaloids

8. Microprapagation of the plants is carried out through

(a) Cross fertilization (b) Seed germination

(c) Plant tissue culture (d) Grafting

9. Aconitine belongs to the group of

(a) Steroidal alkaloids (b) Terpenoidal alkaloid

(c) Indole alkaloid (d) Quinoline alkaloid

10. Crude fibre value of a drug is measure of

(a) Soft tissue matter (b) Woody matter

(c) Mineral matter (d) Organic matter

11. One of the units used for expressing pressure is 'torr' and is equal to

(a) cm of Hg (b) mm of mercury (c) psi (d) gause

12. Removal of a single electron from a molecule results in the formation of

(a) Fragment ion (b) Metastable ion

(c) Molecular ion (d) Rearrangement ion

13. Nuclear magnetic movement is NOT shown by

(a) ^{13}C (b) ^{16}O (c) ^{1}H (d) ^{15}N

14. Derivatisation techniques in HPLC are intended to enhance

(a) Molecular weight (b) Detectability (c) Reversibility (d) Reproducibility

15. A conductance cell is calibrated by using a solution of known conductivity i. e.usually a solution of

(a) NaCl (b) Hg_2Cl_2 (c) KCl (d) Na_2SO_4

16. **Metoclopramide** is generally used for

(a) Prophylaxis of vomiting (b) Preventing motion sickness

(c) Treating irritable bowel syndrome (d) Treatment of pancreatic insufficiency

17. DNA amplification by the polymerase chain reaction uses

(a) *Thermus aquatiucs* DNA polymerase (b) DNA topoisomerase

(c) RNA polymerase (d) RNA helicase

18. Identify the non-pathogenic organism

(a) *Mycobacterium bovis* (b) *Mycobacterium smegmatis*

(c) *Mycobacterium avium* (d) *Mycobacterium intracellulare*

19. Bioassay are carried out to
    (a) Measure the pharmacological activity of a drug
    (b) Avoid clinical trials for newdrugs
    (c) Detect the impurity in a given drug
    (d) Screen for pharmacogeniticInfluences of new drugs
20. A direct way of studying idiosyncratic reactions to the given drug is by
    (a) Changing the route of drug administration
    (b) Change the assay method
    (c) Pharmacogenomic
    (d) Structure activity relationship studies of a family of compounds
21. An example of haemopoietic growth factor is
    (a) Platelet derived factor (b) Epidermal growth factor
    (c) Iron dextran (d) Erythropoietin
22. Safranin is used as a reagent to detect
    (a) Gram-negative bacteria (b) Gram-positive bacteria
    (c) Acid fast bacteria (d) Myxozoa
23. Sulphonamides do not have adverse drug interaction with
    (a) Oral anticoagulants
    (b) Sulfonylurea hypoglycemic agent
    (c) Hydantoin anticonvulsant
    (d) Dihydro folate reductase inhibitors
24. Simvastatin belongs to
    (a) HMG CoA reductase inhibitor type of antilipidemic agents
    (b) HMG CoAreductase inhibitor type of anticoagulant agents
    (c) Fibrate type of anticoagulantagents
    (d) Fibrate type of antilipidemic agents
25. HIV infection can be clinically controlled with
    (a) Cytarabine (b) Acyclovir (c) Zidovudine (d) Amantadine
26. The measure of cohesive strength of the cross linking that occurs between gelatin molecules and is proportional to the molecular weight of gelatin is so called
    (a) Bloom Strength (b) Viscosity
    (c) Surface tension (d) Partition coefficient
27. A water soluble substance used as coating material in microencapsulation process is
    (a) Polyethylene (b) Silicone
    (c) Hydroxy ethyl cellulose (d) Paraffin
28. One of the following is used as a solubilizing agent to solubilize testosterone inpharmaceutical liquid dosage forms.
    (a) Sucrose monoesters (b) Lanolin esters
    (c) Lanoline ethers (d) Tween

29. One of the following is used as a pH dependent controlled release expicient.

(a) Carnauba wax (b) Hydroxyl propyl methyl cellulose phthalate

(c) Methyl cellulose (d) Glyceryl monosterate

30. The Schedule in D & C Act that deals with the standards for disinfectant fluids is

(a) Schedule B (b) Schedule F (c) Schedule O (d) Schedule M

(Q.31-90) CARRY TWO MARK EACH

31. The carboxyl group of aspirin is esterified with N-acetyl-p-aminophenol to get

(a) 3-Acetamidophenyl-o-acetyl salicylate (b) 4-Acetamidophenyl-o-acetyl salicylate

(c) O-(2-hydroxy benzoyl) salicylic acid (d) 2-Acetamidophenyl-o-acetyl salicytate

32. IUPAC system of nomenclature for **Diclophenac sodium(BP)** is

(a) Sodium 2-[(2,6-Dichlorophenyl) amino] phenyl acetate

(b) Sodium 3-[(2,6-Dichlorophenyl)amino] phenyl acetate

(c) Sodium 2-[(2-Chlorophenyl) amino] phenyl acetate

(d) Sodium 2-[(6-Chlorophenyl) amino] phenyl acetate

33. 1-(2-Aminoethyl) perhydroazocine on treatment with S-methyl isothiourea gives rise to an adrenergic neuron blocking agent

(a) Bethanidine (b) Mecamylamine

(c) Guanadrel (d) Guanethidine

34. **Quercetin** is

(a) 5, 7, 3'-Trihydroxy flavones (b) 5, 7, 3', 4'-Trihydroxy flavones

(c) 3, 5, 7, 3', 4'-Pentahydroxy flavonol (d) 3, 5, 7, 3', 4'-Pentahydroxy dlavonone

35. **Meconic acid** is a chemical market for the genus

(a) Piper (b) Pilocarpus (c) Prunus (d) Papaver

36. A novel diterpenoid isolated from the of *Taxus brevifolia* is

(a) Demecolcine (b) Paclitaxel (c) Vinblastin (d) Brevifolicin

37. The absorption maximum for polar compound is usually shifted with change in polarity of the solvents due to

(a) Hydrogen bonding (b) Chemical reaction

(c) Ionization of the compound (d) Change in the chromophore

38. A titration in which potential applied across two electrode is maintained at a constant value and the current is measured and plotted against volume of titrant is

(a) Potentiometric titration (b) Amperometric titration

(c) Displacement titration (d) Conductometric titration

39. The parameter in the elution curve that is proportional to the concenteration of a compound in gas chromatographic effluent is the

(a) Number of peaks (b) Width of the peak

(c) Area under the peak (d) Shape of the peak

40. A drug solution has a half life of 21 days. Assuming that the drug undergoes first order kinetics, how long will it take for the potency to drop to 90% of the initial potency

(a) 3.2 days (b) 9.6 days (c) 16 days (d) 6.4 days

41. An amphoteric surfactant used in pharmaceutical disperse systems is

(a) Bile salts (b) Lecithin

(c) Sorbitan monolaurate (d) Sorbitan monostearate

42. An abrasive used in dentifrices is

(a) Dicalcium phosphate (b) Sodium carboxy methyl cellulose

(c) Sodium lauryl sulfate (d) Dioctyl sodium sulfosuccinate

43. An electrochemical method that enhances the transport of some solute molecules by creating a potential gradient through skin tissue with an applied electrical current or voltage is called

(a) Electrophoresis (b) Iontophoresis (c) Osmosis (d) Implants

44. Apatient with rheumatoid arthritis has been taking acetyl salicylic acid regularly. However, recently she has been experiencing stiffness, swelling andpain due to salicylate resistance. She has occult blood in her feaeces. Suggest an appropriate drug suitable for her from those mentioned below

(a) Paracetamol (b) Celecoxib (c) Piroxicam (d) Naproxen

45. The break down of fibrin is catalysed by

(a) Plasmin (b) Renin (c) Urokinase (d) Ptylin

46. Which one of these best describes a process carried out to render a drug pharmacokinetically more acceptable

(a) Enteric coating of diclofenac

(b) Co-administration of aspirin with antacids

(c) Use of colloidal suspension or liposomes for administering Amphotericin-B

(d) Synthesis of an analogue to obtain high receptor specificity

47. Azithromycin is clinically administered once daily as compared to erythromycin which is administered every 6 hours because, azithromycin

(a) Penetrates into most tissue and is released very slowly

(b) Has a methylated nitrogen in its lactone ring which renders it much more potent than Erythromycin

(c) Is a very potent antibiotic but not tolerated well in the gastrointestinal tract

(d) Is usually presented in a sustained release dosage

48. A patient showing muscle rigidity, bradykinesia, termors and postural instability was administered levodopa. Which of the properties of levo-dopa is not true

(a) Levo-dopa is preferred over dopamine because it can cross the blood brain barrier

(b) Levo-dopa is the levorotatory stereoisomer of 3, 4-dihydroxy phenylalanine

(c) Levo-dopa gets decarboxylated in the brain to dopamine

(d) Levo-dopa is administered because of its strong antagonistic action on dopamine receptors

49. Autoimmunity refers to

(a) An automatic trigger of the immune system directed against a specific pathogen

(b) Failure to distinguish between self and non-self

(c) An automatic segregation of T and B cells

(d) Failure of B-cells to interact with T-cells

50. Which of these is true about the discovery of HB antigen in the blood of people infected with Heptatitis-B

(a) It provided a basis for vaccine design

(b) It indicated that specific vaccines cannot be designed for Hepatitis-B

(c) It has not been of much significance

(d) It indicated that Hepatitis-B is a viral disease

51. Which drug molecule does not have phenylethyl amine moiety

(a) Amphetamine (b) Glyburide (c) Pheniramine (d) Mescaline

Q. 52-58 are multiple selection items. P, Q, R, S are the options. Two of these options are correct. Choose the correct combination from among the alternatives A, B, C and D.

52. There are two methods by which the duration of action if insulin may prolonged

(P) Binding with resins

(Q) Esterification of aminio acid residues

(R) Forming of complex of insulin with protein

(S) Modification of particle size

(a) Q, R (b) R, S (c) P, S (d) P, R

53. The attributes of cycloserine are

(P) No tautomeric shown

(Q) Exists in equilibrium with its tautomeric enolic form

(R) Stable in alkaline solution, destroyed rapidly at neutral or acidic pH

(S) Stable in neutral solution, destroyed in alkaline pH

(a) R, S (b) P, Q (c) Q, R (d) P, R

54. Compared to **benzyl penicillin, amoxicillin** has the following advantages in biological properties

(P) The amino group renders the antibiotic resistant to acid catalysed degradation

(Q) The spectrum of activity is broadened

(R) The amino group renders penicillinase resistance to the compound

(S) The phenolic group renderspenicillinase resistance to the compound

(a) P, Q (b) P, R (c) P, S (d) Q, R

55. The identification of propellants in pharmaceutical aerosols is carried out by

(P) Gas-chromatography (Q) Tag-open cup apparatus

(R) Pycnometer (S) IR Spectrophotometer

(a) P, Q (b) P, S (c) Q, R (d) R, S

56. Schedule 'H' and Schedule 'S' as per the Drugs & Cosmetics Act deal with the following

(P) Prescription drugs which are required to be sold by retail only on prescription of RMP

(Q) Standard for cosmetics

(R) Biological and special products

(S) List of coal tar colours permitted to be used in cosmetics and soaps

(a) P, Q (b) P, R (c) Q, S (d) R, S

57. *Myristica fragrans* Houtt. Has two of the following characteristics

(P) An indeciduous tree, which produces drupaceous, pale yellow fruits

(Q) Each fruit has several round seeds with smooth surface and lignaceous tegument, and the red fleshy aril-the mace, is present inside the seed

(R) A deciduous tall tree, which produces lignaceous capsules

(S) Each fruit has a unque ovoid seed, with lignified tegument, surrounded by orange red laciniate fleshy aril-the mace

(a) Q, R (b) P, R (c) P, S (d) Q, S

58. In size exclusion chromatography the stationary phases used are

(P) Alumina (Q) Dextran (R) Agarose (S) Styrene

(a) P, S (b) Q, R (c) Q, S (d) P, R

Q. 59-65 are "Matching" exercises. Match Group I with Group II. Choose the correct combination from among the alternatives A,B,C and D.

59.

Group I **Synthetic Drug**	**Group II** **Intermediates from which Group I drugs are synthesized**
(P) Buclizin	1. Aziridin and thiophosphoryl chloride
(Q) Chlorphenesin	2. 4-Chlorophenol
(R) Thiotepa	3. 4-Chlorobenzhydryl chloride
(S) Alprazolam	4. 2-Amino-5-chloro benzophenone

(a) P-3, Q-2, R-1, S-4 (b) P-4, Q-2, R-1, S-3

(c) P-2, Q-4, R-3, S-1 (d) P-1, Q-2, R-4, S-3

60.

Group I **Cardiac Agents**	**Group II** **Mechanism of Action**
(P) Digitoxin	1. Produces negative inotropic effect by blocking calcium Channels
(Q) Dobutamine	2. Depresses adrenergically enhanced calcium influx through beta receptor blockade
(R) Sotalol	3. Causes elevation of cAMP levels by stimulation of adenylate Cyclase
(S) Nicardipine	4. Inhibits membrane bound sodium potassium ATPase pump

(a) P-4, Q-3, R-2, S-1
(b) P-3, Q-4, R-1, S-2
(c) P-4, Q-2, R-3, S-1
(d) P-4, Q-3, R-1, S-2

61. **Group I**
Technique employed
(P) Visible spectrophotometry
(Q) IR spectrophotometry
(R) NMR spectrophotometry
(S) Fluorescence spectrophotometry

Group II
Source of Radiation
1. R_f Source transmitter
2. Xenon lamp
3. Tungsten lamp
4. Nernst glower

(a) P-2, Q-4, R-3, S-1
(b) P-3, Q-2, R-1, S-4
(c) P-3, Q-4,R-1, S-2
(d) P-4, Q-1, R-3, S-2

62. **Group I**
Amino acids
(P) Aspartic acid
(Q) Arginine
(R) Serine
(S) Methionine

Group II
Common degradative products that are citric acid cycle intermediates or their precursors
1. Succinyl CoA
2. Alpha-Ketoglutarate
3. Fumarate
4. Pyruvate

(a) P-3, Q-2, R-4, S-1
(b) P-3, Q-1, R-4, S-2
(c) P-1, Q-2, R-3, S-4
(d) P-4, Q-2, R-3, S-1

63. **Group I**
Tablet defects
(P) Picking
(Q) Sticking
(R) Mottling
(S) Lamination

Group II
Explanation
1. A term used to describe the surface material from a tab that is sticking to and being removed from the tablet's surface by a punch
2. Term refers to tablet material adhering to the die wall
3. Term refers to an unequal distribution of colour on a tablet
4. Term refers to separation of a tablet into two or more distinct layers

(a) P-1, Q-2, R-3, S-4
(b) P-1, Q-3, R-4, S-2
(c) P-2, Q-4, R-3, S-1
(d) P-3, Q-1, R-2, S-4

64. **Group I**
Lanatosides
(P) Lanatoside A
(Q) Lanatoside B
(R) Lanatoside C
(S) Lanatoside D

Group II
Aglycone
1. Gitoxigenin
2. Diginatigenin
3. Digoxigenin
4. Digitoxigenin

(a) P-1, Q-4, R-3, S-2
(b) P-1, Q-2, R-4, S-3
(c) P-3, Q-4, R-2, S-1
(d) P-2, Q-3, R-1, S-4

65.

Group I	**Group II**
Specific chemical test	**Phytoconstituents**
(P) Thalleioquin Test	1. Hyoscyamine
(Q) Murexide test	2. Barbaloin
(R) Vitali-Morin test	3. Quinine
(S) Modified Borntrager's test	4. Theobromine

(a) P-2, Q-3, R-4, S-1
(b) P-3, Q-4, R-1, S-2
(c) P-1, Q-2, R-3, S-4
(d) P-4, Q-1, R-2, S-3

Data for Q. 66-90 are based on the statement/problem. Choose the correct answer for each question from the option A,B,C,D.

Data for (Q.66 - 68)

In a formation development laboratory a tablet is to be formulated. The core tablet has a bad taste and requires physical and chemical protection of the drug from moisture. The tablet should also deliver the drug for the local action in the intestine.

66. Suggest a suitable method
(a) Sugar coating (b) Film coating (c) Enteric coating (d) Sub coating

67. Choose the correct coating material to be used
(a) Sugar
(b) Acacia
(c) Ethyl cellulose
(d) Cellulose acetate phthalate

68. Choose the correct solvent for the coating material
(a) Acetone (b) Water (c) Propylene glycol (d) Glycerin

Data for (Q.69-70)

Compound A with formula C_2H_7N shows the following important bands in the IR spectra (a) 3423cm^{-1}, (b) 3236cm^{-1}

69. Assign these bands to the important group in the compound A
(a) $-CH_3$ (b) $-NH_2$ (c) $-CN$ (d) $=C=N-$

70. On treatment with nitrous acid the compound A is converted to B, which shows a strong band at 3430cm^{-1}. Assign the absorption band for the group formed in the product
(a) $-OH$ (b) $=C=N-$ (c) $-COOH$ (d) $-N=N-$

Data for (Q.71-73)

In the assay of sulfamethoxazole I.P ($C_{10}H_{11}N_3O_3S$), 0.2g of the sample was dissolved in 50ml of 2M HCl. To this was added 3g of KBr and the titration was carried out.

71. Titration was carried out using
(a) $NaNO_2$ to estimate the amino group
(b) $NaNO_2$ to estimate the sulphonamido group
(c) NaOH to estimate the amino group
(d) NaOH to estimate the sulphonamido group

72. The end point in the assay-was determined by

(a) Conductometric method (b) Using an indicator

(c) Potentiometric method (d) Photometric method

73. If the volume of 0.1 M titrant consumed was 7.8 ml. calculate the% purity of the sample

(a) 99.70% (b) 9.97% (c) 8.87% (d) 98.79%

Data for (Q.74-75)

A drug which is unstable to light, susceptible to oxygen and gets degraded in presence of metailic ions, has to be formulated in the form of a solution for injection.

74. Choose a suitable additive to improve the stability of the injection

(a) Preservative (b) Chelating agent (c) Buffer (d) Tonicity contributor

75. Select the appropriate filling and method for the above product

(a) Filling in an amber colored ampoule with an additioin of antioxidant, replacing the inside air with nitrogen and sealing

(b) Filling with an antioxidant dissolved in the solution and sealing the ampoule

(c) Filling in an amber colored ampoule with a preservative and sealing

(d) Filling in an ampoule, sealing and giving direction to store it in dark

Data for (Q.76-77)

The usual adulterants for buds are clove stalks and anthophyll

76. Clove stalks can be identified by the presence of

(a) Starch grains (b) Cystoliths

(c) Lignified sclereids (d) Acicular crystals of calcium oxalate

77. Anthophylli can be identified by the presence of

(a) Lignified sclereids (b) Acicular crystals of calcium oxalate

(c) Cystoliths (d) Starch grains

Data (Q. 78-80)

Plant tissue culture of carrot is being developed in the laboratory on a semisolid White's medium.

78. The micronutrient essential in the medium is

(a) NaCl (b) $CoCl_2$ (c) KCl (d) $CaCl_2$

79. The pH of the medium is

(a) 6.6 (b) 6.0 (c) 5.6 (d) 5.0

80. The tissue growth observed is

(a) Undifferentiated cells suspended in the medium

(b) Undifferentiated cells in clusters distributed in the medium

(c) Differentiated mass of cells

(d) Surface growth of undifferentiated mass of cells

Data for (Q. 81-82)

In glucose metabolism, name the enzymes catalyzing the following step.

81. Conversion of glucose to clucose-6-phosphate

(a) Hexokinase
(b) Glucose-6-phosphate dehydrogenase
(c) Glycogen phosphorylase
(d) Glycogen synthase

82. Conversion of 2-phosphoglycerate to phosphoenol pyruvate

(a) Pyruvate kinase
(b) Phosphoglycerate mytase
(c) Phosphoglycerate kinase
(d) Enolase

Data for (Q. 83-84)

Methotrexate, trimethoprim and pyrimethamine are all known to be inhibitors of dihydrofolate reductase. Yet they are classified in different therapeutic categories

83. Trimethoprim has an advantage over methotrexate in its therapeutic category because

(a) Trimethoprim binds to bacterial DHFR about 50,000 times more strongly as compared to the host DHFR
(b) Trimethoprim can be administered orally
(c) Trimethoprim exhibits to significant adverse effects
(d) Trimethoprim has additional anti-inflammatory properties

84. Methotrexate is thought to exert its actions by

(a) Interfering with purine synthesis
(b) Intracellular formation of an amine adduct
(c) Forming a conjugate with nucleic acids
(d) Inhibiting the synthesis of folic acid

Data for (Q. 85-87)

An administrative officer having high blood pressure, gastric acidity and diabetes is prescribed famotidine enalapril and tolbutamide.

85. From the structural features of the drugs, predict which will be ionized in the stomach

(a) Famotidine
(b) Enalapril
(c) Tolbutamide
(d) Enalapril and tolbutamide

86. The patient cannot tolerate enalapril. Which of the following can be substituted?

(a) Omeprazole
(b) Losartan
(c) Rosiglitazone
(d) Clofibrate

87. Famotidine acts as

(a) H_1-histamine antagonist
(b) H_2-histamine antagonist
(c) Proton pump inhibitor
(d) H_1agonist

Data for (Q. 88-90)

2-Methoxy naphthalene on treatment with acetyl chloride in presence of $AICI_3$ gives 2-acetyl-6-methoxy naphthalene. This is converted with a set of reagents-X to 6-methoxy-2-naphthyl acetic acid, which is esterified with methanol to the mehyl ester. Ester on treatment with Y gives DL-2-(6-methoxy-2-naphthyl)-propionic acid methyl ester. This on hydrolysis gives Z(final compound)

88. The set of reagents- X are

(a) Morpholine /Sulphur followed by H_2SO_4/H_2O (b) Morphine/Sulphur followed by HCl/H_2O

(c) Formic acid/Cu followed by acetic acid (d) Hydroiodic acid followed by H_2SO_4/H_2O

89. Identify the reagents –Y

(a) $NaOH/CH_3OH$ (b) NaH/CH_3I

(c) Hydrazine/CH_3I (d) $LiAlH_4/CH_3OH$

90. The final compound Z is

(a) Naphazoline (b) Carprofen (c) Pranoprofen (d) Naproxen

End of paper

ANSWER KEY GATE 2004

1 – a	2 – c	3 – d	4 – c	5 – b	6 – d
7 – b	8 – c	9 – b	10 – c	11 – b	12 – c
13 – b	14 – b	15 – c	16 – a	17 – b	18 – a
19 - a	20 – c	21 – c	22 – a	23 – d	24 – a
25 – c	26 – a	27 – c	28 – d	29 – b	30 – c
31 – b	32 – a	33 – d	34 – b	35 – d	36 – b
37 – c	38 – b	39 – b	40 – a	41 – b	42 – a
43 – b	44 – b	45 – a	46 – c	47 – a	48 – d
49 – b	50 – a	51 – b	52 – a	53 – c	54 – a
55 – b	56 – a	57 – b	58 – b	59 – a	60 – a
61 – c	62 – a	63 – a	64 – c	65 – b	66 – c
67 – d	68 – c	69 – b	70 – a	71 – a	72 – c
73 – a	74 – b	75 – a	76 – c	77 – d	78 – b
79 – c	80 – b	81 – a	82 – d	83 – a	84 – d
85 – a	86 – b	87 – b	88 – a	89 – b	90 – d