



GPAT 2022

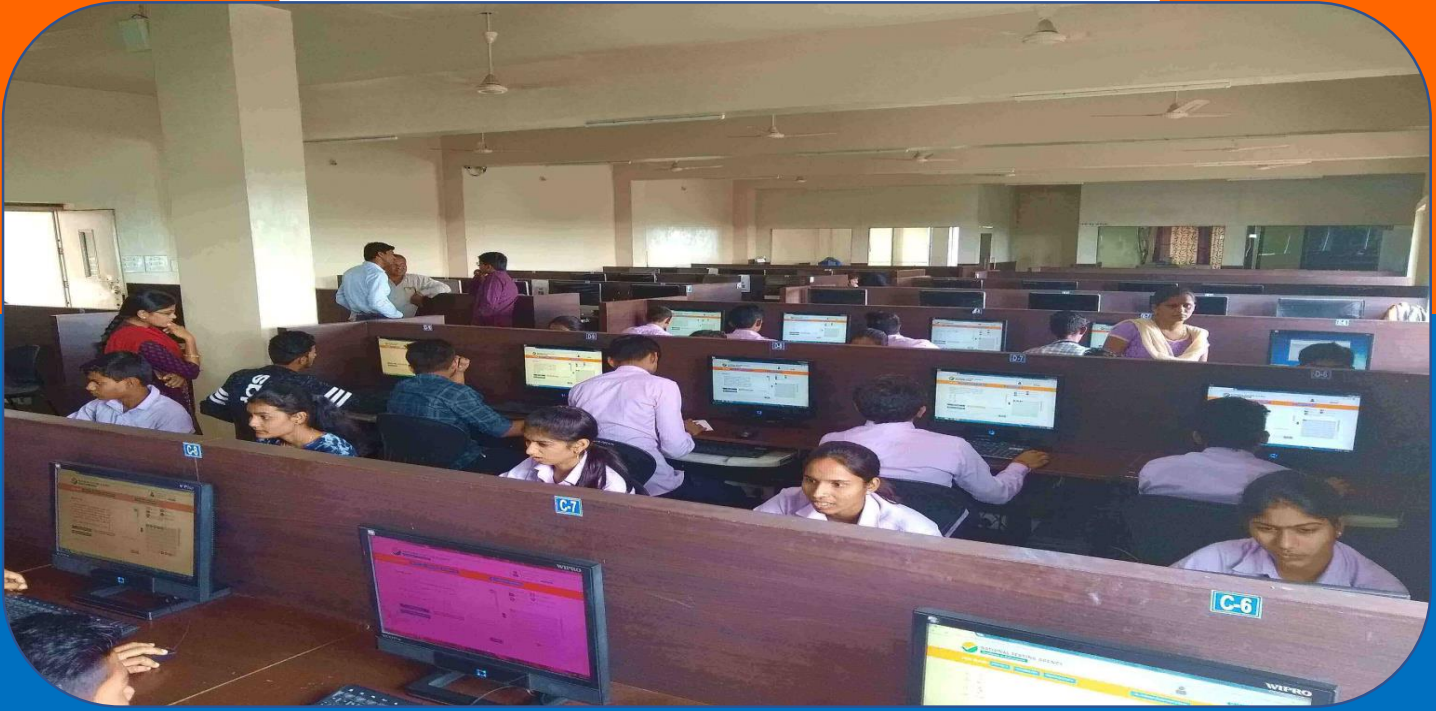


QUESTION PAPER WITH ANSWER KEY



राष्ट्रीय परीक्षा एजेंसी
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QUESTION PAPER

PHARMACEUTICS

- The intracellular fluid volume including those of the blood cells is approximately**
(a) 15 litres (b) 20 litres (c) 27 litres (d) 35 litres
- India's first Central Drug Laboratory was established at**
(a) Mumbai (b) Lucknow (c) Kolkata (d) Hyderabad
- Which of the following instrument is used to determine surface area and pore structure of pharmaceutical powders**
(a) Coulter counter (b) Anderson apparatus (c) Quantasorb (d) Optical microscopy
- In the process of extraction, if maceration is accomplished by heating the drug and solvent in a close vessel, then this modification is known as**
(a) Digestion (b) Refining (c) Expression (d) Rendering
- The below mentioned complex is not the type of inclusion compounds**
(a) Channel-Lattice type (b) Quinhydrone complex
(c) Layer type (d) Clathrates
- Prescription price consists of**
(a) Cost of ingredients only
(b) Cost of professional fee only
(c) Cost of ingredients and cost of dispensing only
(d) Cost of ingredients and professional fee only
- Given below are two statements**
Statement [I] : Drugs Controller General of India is the Chairman of Drugs Technical Advisory Board (DTAB)
Statement [II] : In DTAB, there will be eight ex-officio members, five nominated and five elected members
In light of the above statements, choose the most appropriate answer from the options given below
(a) Both Statement I and Statement II are correct
(b) Both Statement I and Statement II are incorrect
(c) Statement I is correct but Statement II is incorrect
(d) Statement I is incorrect but Statement II is correct
- Water for injection is prepared by using distillation**
(a) Fractional (b) Molecular (c) Simple (d) Steam
- As per the Pharmacy Act, in the composition of Pharmacy Council of India, the total number of Ex-officio members is**
(a) THREE (b) FOUR (c) SIX (d) EIGHT

10. Match List I of Unit operations of crystallizers with List II of principle/characteristics properties of crystallizer

CRYSTALLIZER UNIT OPERATIONS	PRINCIPLE/CHARACTERISTICS PROPERTIES
A. Swenson-walker crystallizer	I. Adiabatic evaporative cooling
B. Krystal crystallizer	II. Cooling alone
C. Vacuum crystallizer	III. Evaporation
D. Forced circulation type crystallizer	IV. Heat exchange, separation, circulation

Choose the correct answer from the options given below

- (a) A -I, B -II, C -IV, D -III (b) A -III, B -I, C -IV, D -II
 (c) A -I, B -IV, C -III, D -II (d) A -II, B -III, C -I, D -IV
11. The process of establishing a product in the minds of target customer is called as
 (a) Product positioning (b) Product differentiation
 (c) Product targeting (d) Market segmentation
12. Which of the following materials are specified as a suitable diluent for powdered opium
 A. Powdered grass
 B. Powdered cocoa husk
 C. Lactose colored with burnt sugar
 D. Powdered digitalis
- Choose the correct answer from the options given below
 (a) A and D only (b) B and D only (c) B and C only (d) A and C only
13. Which of the following statement is false?
 (a) Reducing agents often cause fading of dyes
 (b) Anionic dyes are the most stable at acid pHs
 (c) Basic dyes are not sensitive to alkalies
 (d) Cationic dyes may be precipitated by soaps and clays
14. In the process of sugar coating, to prevent moisture penetration into the tablet core, which one of the following step is performed
 (a) Seal Coating (b) Subcoating (c) Syrup Coating (d) Polishing
15. Oral efficacy of Sabin Polio Vaccine can be adequately explained by which of the following processes of absorption
 (a) Passive diffusion (b) Active transport
 (c) Ion - pair transport (d) Pinocytosis
16. Hospital Formulary contains information on the following parameters EXCEPT
 (a) Composition (b) Indication
 (c) Pricing (d) Dosage and administration
17. Which one of the following is a rate equation for second order bimolecular reaction if, a and b are the initial concentrations of A and B, respectively, and x is the concentration of each species reacting in time t and k is second-order reaction



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- (a) $k = [2.303 / t(a - b)] \times [\log a(a - x) / b(b - x)]$
 (b) $k = [2303 / t(a - b)] \times [\log b(a - x) / a(b - x)]$
 (c) $k = [2303 / t(a - b)] / [\log b(a - x) / a(b - x)]$
 (d) $k = [2303 / t(a - b)] / [\log a(a - x) / b(b - x)]$

18. Which of the following DRYERS is a "static bed dryer"

- (a) Freeze dryer (b) Fluid bed dryer (c) Spray dryer (d) Flash dryer

19. In thermoplastic materials, which are used as a container/packaging material, additives like polyethylene and polypropylene are used as

- (a) Plasticizer (b) Stabilizers
 (c) Surface treatment film (d) Slip agent

20. Match List I with List II

List I	List II
A. When two dosage forms have equal t_{max}	I. When their total body clearance is constant
B. AUC values of the two analogs can be compared to measure relative bioavailability	II. Absorption rate constants are equal
C. Urinary data is valid to measure bioavailability	III. When fraction absorbed and elimination rate is constant
D. C_{max} is proportional to the rate of absorption	IV. Excretion of drug and/or metabolite is related to the bioavailable dose

Choose the correct answer from the options given below

- (a) A - II, B - I, C -IV, D - III (b) A -I, B -II, C -III, D -IV
 (c) A -I, B -IV, C -III, D -II (d) A -III, B -I, C -II, D -IV

21. Boston Consulting Group (BCG) Matrix is used for

- (a) Product life cycle management (b) SWOT analysis
 (c) Product portfolio management (d) Gap analysis

22. Given below are two statements

Statement [I] : Vertical long tube evaporator is also called as Rising film evaporator

Statement [II] : Falling film evaporator is also called as Forced circulation type evaporator

In light of the above statements, choose the most appropriate answer from the options given below

- (a) Both Statement I and Statement II are correct
 (b) Both Statement I and Statement II are incorrect
 (c) Statement I is correct but Statement II is incorrect
 (d) Statement I is incorrect but Statement II is correct

23. Of the following, which one is exempted from importing into India without the requirement of a license



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- (a) Insulin (b) Etoposide (c) Lactose (d) Glutethimide

24. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion [A] : During the process of decompression in tablet manufacturing, expansion occurs in some tablet

Reason [R] : Expansion occurs in some tablet because of Plastic deformation that has occurred during compression process

In light of the above statements, choose the correct answer from the options given below

- (a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is NOT the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true

25. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion [A] : The pressure filling method for filling pharmaceutical aerosol is usually preferred over cold filling method

Reason [R] : Because with pressure filling method high production speed can be achieved and less propellant is lost

In light of the above statements, choose the correct answer from the options given below

- (a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is NOT the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true

26. **Statement [I] :** The problem of declining potency in an unstable preparation can be ameliorated by the addition of an excess or overage of the active ingredient
Statement [II] : Overages, are added to pharmaceutical formulations to keep the content of the active ingredient well above the limit, compatible with therapeutic requirements, for a predetermined period of time

- (a) Both Statement I and Statement II are correct
(b) Both Statement I and Statement II are incorrect
(c) Statement I is correct but Statement II is incorrect
(d) Statement I is incorrect but Statement II is correct

27. _____ is the practice of pharmacy in private and government-owned hospitals, health maintenance organizations (HMOs), clinics, walk-in health centers, and nursing homes

- (a) Community pharmacy (b) Government service
(c) Health-systems pharmacy (d) Organizational management



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28. Which one of the following statement holds true for Passive Diffusion

- (a) Greater the area and greater the thickness, faster is the diffusion
- (b) Rate of drug transfer is directly proportional to the concentration gradient between GI fluids and the blood compartment
- (c) Rate of transfer of ionised drug species is 3-4 times the rate for unionised drug species
- (d) Greater the membrane/water partition coefficient of drug, slower is the absorption

29. Select correct option for miscible solvents

A. Water and alcohol

B. Acetone and alcohol

C. Water and benzene

D. Carbon tetrachloride and benzene

Choose the correct answer from the options given below

- (a) A and B only (b) A, B and C only (c) A, B and D only (d) A and D only

30. Which of the following is most appropriate to crystalline solid

- (a) Give diffraction bands
- (b) Characteristics geometrical shapes
- (c) Sharp melting point
- (d) All of these

31. Which of the following is NOT a cause for the drug undergoing nonlinear pharmacokinetics

- (a) Enzyme inhibition
- (b) Enzyme induction
- (c) Saturation of carrier molecules
- (d) Saturation of plasma protein binding

32. Which of the following vehicles (not required to be sterile, but must be pyrogen free) is intended to be used in the manufacture of injectable products to be sterilized after preparation

- (a) Purified Water
- (b) Water for Injection USP
- (c) Sterile Water for Injection USP
- (d) Bacteriostatic Water for Injection USP

33. Decrease in effective surface area available to the dissolution medium leading to a fall in the dissolution rate, may happen due to which one of the following reasons

- (a) Addition of cyclodextrin
- (b) Addition of surfactant to increase the surface tension
- (c) Addition of hydrophilic diluent
- (d) Surface charges due to extreme particle size reduction

34. In the process of adding lubricant to a granulation, the lubricant is divided finely by passing it through 60-100 mesh nylon cloth on to the granulation, in production this process is called as the lubricant

- (a) Bolting
- (b) Mixing
- (c) Tumbling
- (d) Grinding

35. Which one of the following manufacturing facility may not be required for oral solid dosage form

- (a) Material, Handling
- (b) Chemical weighing
- (c) Blending
- (d) Aseptic filling



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36. The temperature at which the solubility of the surfactant is equal to the CMC, is called as
- (a) Critical micellar concentration (b) Kraft point
(c) Cloud point (d) Solubilization
37. Cottrell's method is used for the measurement of
- (a) Depression of freezing-point (b) Elevation of boiling-point
(c) Lowering of vapour pressure (d) Osmotic pressure
38. Drugs 'A', 'B' and 'C' follow zero order, first order and second order degradation kinetics, respectively, but have the same rate constant Which of the following statement is true in this respect
- (a) Drug 'A' will be the first to degrade by 50%
(b) Drug 'B' will be the first to degrade by 50%
(c) Drug 'C' will be the first to degrade by 50%
(d) Drugs 'B' and 'C' will degrade by 50% at the same time
39. Which of the following is an example of a thermosetting plastic material
- (a) PVC (b) Polyester (c) Polypropylene (d) Urethanes
40. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R
- Assertion [A] :** In the manufacturing of glycerogelatin suppositories, overfilling of mould is necessary
- Reason [R] :** Glycerogelatin bases contract very little on cooling and the excess cannot be neatly removed
- In light of the above statements, choose the correct answer from the options given below**
- (a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true and R is the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true
41. A typical skin cream consisting of stearic acid, potassium hydroxide, glycerin, water, preservative and perfume, would be commonly known as
- (a) Cold cream (b) Vanishing cream
(c) Foundation cream (d) All purpose cream
42. Which of the following conjugation reactions DOES NOT REQUIRE reaction with an activated conjugating agent
- (a) Glucouronidation (b) Sulfation
(c) Methylation (d) Glutathione conjugation



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PHARMACOLOGY

43. Match List I with List II Match the following drugs with their classes

List I	List II
Drugs	Classes
A. Anakinra	I. IL-2 receptor antagonist
B. Basiliximab	II. TNF α inhibitors
C. Infliximab	III. Calcineurin inhibitors
D. Tacrolimus	IV. mTOR inhibitors
	V. IL-1 receptor antagonist

Choose the correct answer from the options given below

- (a) A -III, B -II, C -I, D - IV (b) A -V, B -II, C -III, D - I
 (c) A -I, B -III, C -V, D -II (d) A -V, B -I, C -II, D - III

44. Which of the following is a malignant type of tumor

- (a) Lipoma (b) Adenoma (c) Melanoma (d) Osteoma

45. In human body — system operates to maintain pH of blood plasma

- (a) The acetate buffer (b) The lysis buffer
 (c) The potassium citrate (d) The carbonic acid

46. Match List I with List II Match the following with their mechanism of action

List I	List II
MECHANISM OF ACTION	DRUGS
A. DPP4 inhibitors	I. Metformin
B. K _{ATP} Channel blocker	II. Pioglitazone
C. PPAR γ activator	III. Glimpiride
D. AMPK Activator	IV. Teneligliptin
	V. α glucosidase inhibitors

Choose the correct answer from the options given below

- (a) A -II, B -V, C -III, D -IV (b) A - II, B - III, C -IV, D -I
 (c) A -IV, B -III, C -II, D -I (d) A -IV, B - I, C -V, D -III

47. Blood grouping is basically possible because of the presence of following

- (a) Antigens on RBCs (b) MHCs on WBCs
 (c) MHCs on RBCs (d) Antigens on WBCs

48. The objective of the Abbreviated New Drug Application is to

- (a) Get approval to conduct clinical trials
 (b) Get market approval of new chemical entities
 (c) Get market approval of generics
 (d) Get approval for animal studies of new chemical entities



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49. Which of the following could be the reason(s) for Pharmacokinetic Drug Interactions?

A. Interference with absorption

B. Changes in protein binding

C. Competition at receptor sites

D. Interference with renal excretion

Choose the correct answer from the options given below

- (a) A, B and C only (b) A, B and D only (c) A, C and D only (d) C only

50. Match the following phases of clinical trial with their significance

List I	List II
A. Phase-I	P. Post marketing surveillance
B. Phase-0	Q. Microdosing
C. Phase-3	R. First in human dose
D. Phase-4	S. Multicentric trials

Choose the correct answer from the options given below

- (a) A-R, B-Q, C-P, D-S (b) A-R, B-Q, C-S, D-P
(c) A-Q, B-S, C-P, D-R (d) A-S, B-P, C-Q, D-R

51. Formation and maintenance of myelin sheath around CNS axons are done by

- (a) Schwann cells (b) Oligodendrocytes (c) Microglia (d) Astrocytes

52. Which of the following statement is true for the periosteum of bone

- (a) Protects the bone by assisting in fracture repair
(b) Has osteogenic cells which enable bone to grow in thickness, but not in length
(c) It is composed of an outer fibrous layer of dense irregular connective tissue and an inner osteogenic layer that consists of cells
(d) All of these

53. Which of the following clinical feature is not responsible for insulin resistance in type 2 diabetes

- (a) Increased LDL (b) Increased HDL
(c) Reduced HDL (d) Increased triglycerides

54. Which of the following is a specific enzyme marker of cell death in acute myocardial infarction

- (a) Creatine Kinase-MB (b) Aspartate aminotransferase
(c) Lactate dehydrogenase (d) Cardiac troponin

55. A patient with pheochromocytoma is undergoing surgery and has not been administered with alpha receptor blocker. If he is administered with intravenous propranolol, then which of the following effects will be evident

- (a) There will be a rise in the blood pressure
(b) There will be a fall in the blood pressure
(c) The blood pressure will remain unchanged
(d) The patient may suffer severe bronchoconstriction



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56. Nitric oxide synthase exists in

- (a) Two isoforms (b) Three isoforms (c) Four isoforms (d) Five isoforms

57. Viable cells (viability assay) are assayed by all of the following methods EXCEPT

- (a) MTT/MTS/Resazurin assay (b) Apoptosis assay
(c) ATP assay (d) Protease marker assay

58. Which of the following statements are true with the Adverse Drug Reactions

- A. Any response to a drug which is noxious and unintended
B. Which occurs at doses normally used in man for prophylaxis, diagnosis or therapy of a disease
C. Adverse drug event is same as that of Adverse Drug Reaction
D. Which occurs at normal dose or overdose when used for prophylaxis, diagnosis or therapy of a disease

Choose the correct answer from the options given below

- (a) A and B are true while C and D are false (b) A and C are true while B and D are false
(c) B, C and D are false, Only A is true (d) A, B and C are false, Only D is true

59. Which of the statement is true in geriatrics practice

- (a) The incidence of Adverse Drug Reactions diminishes with advancement of age
(b) Dose reduction is inevitable for each and every drug used in geriatric patients
(c) Patient compliance is highest in geriatric patients
(d) Polypharmacy is often a problem in elderly

60. The 'Up-and-Down' method for a projected LD50 determination is described in the

- (a) OECD Guideline 401 (b) OECD Guideline 420
(c) OECD Guideline 423 (d) OECD Guideline 425

61. Match List I with List II

List I	List II
Poisoning	Treatment
A. Warfarin	P. Pralidoxime
B. Carbon monoxide	Q. Oxygen
C. Cyanide	R. Vitamin K
D. Nitrites	S. Dicobalt edatate
E. Organophosphates	T. Methylene blue

Choose the correct answer from the options given below. More text goes here

- (a) 1: R, 2: Q, 3: S, 4: T, 5: P (b) 1: P, 2: Q, 3: T, 4: S, 5: R
(c) 1: Q, 2: S, 3: P, 4: R, 5: T (d) 1: T, 2: Q, 3: R, 4: P, 5: S

62. Which of the following is/are not true about Parkinson's disease

- A. Parkinson's disease is caused by the degeneration of the substantia nigra in the midbrain



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- B. Parkinson's disease is caused by the degenerative loss of nigrostriatal dopaminergic neurons
- C. Bradykinesia, rigidity and tremor are the main symptoms in Parkinson's disease
- D. Parkinson's disease is caused by the degenerative loss of nigrostriatal cholinergic neurons

Choose the correct answer from the options given below

- (a) A, B and D only
- (b) A, B and D only
- (c) C only
- (d) D only

63. Tendon rupture or tendonitis of Achilles tendon is an adverse reaction of

- (a) Fluoroquinolones
- (b) Tetracyclines
- (c) Cephalosporins
- (d) Aminoglycosides

64. Regarding Bromocriptine, which of the following statement is TRUE-

- A. It is a relatively selective dopamine D2 agonist with prominent action on pituitary lactotrophs (inhibit prolactin release)
- B. In striatum (antiparkinsonian)
- C. In CTZ (antiemetic)
- D. As an adjunctive treatment for type 2 DM

Choose the correct answer from the options given below

- (a) A, B and D only
- (b) A, B and C only
- (c) B and D only
- (d) A and B only

65. Which of the following statement/s are correct regarding the alkylating agents as anticancer agents

- A. They get converted into highly nucleophilic anions and bind to the nitrogen atom of guanine intercalating the DNA strands
- B. Cyclophosphamide and busulfan belong to this class
- C. They inhibit the DNA synthesis by inhibiting the DNA polymerase enzyme
- D. They inhibit the DNA supercoiling by irreversibly inhibiting the DNA topoisomerase enzyme

Choose the correct answer from the options given below

- (a) A, B and D only are correct
- (b) Only B is correct
- (c) Only A and B are correct
- (d) All A, B, C and D are correct

66. Reason for the combination of Diphenoxylate (25 mg) + Atropine (0.025 mg) is to

- (a) Inhibits the side effects of Diphenoxylate
- (b) Discourage abuse of Diphenoxylate
- (c) Augment the anti-motility action of Diphenoxylate
- (d) Suppress gastroenteritis-related vomiting

67. Which of the following type is a reversible cell injury

- (a) Karyolysis
- (b) Nuclear clumping
- (c) Phagocytosis
- (d) Cytoskeletal damage



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68. A neonate suffering from icterus is intravenously administered with phenobarbital. The justification for this therapy is

- (a) Phenobarbital is a short acting barbiturate and hence safe to induce sleep in neonates
- (b) Phenobarbital suppresses the bilirubin synthesis in neonates
- (c) Phenobarbital suppresses hepatic glucuronyl transferase and increases clearance of bilirubin
- (d) Phenobarbital induces hepatic glucuronyl transferase and increases clearance of bilirubin

69. The quadruple therapy of *Helicobacter pylori* infection includes

- (a) Bismuth subsalicylate, metronidazole, tetracycline and a proton pump inhibitor
- (b) Streptomycin, metronidazole, tetracycline and a proton pump inhibitor
- (c) Sulfasalazine, metronidazole, tetracycline and a proton pump inhibitor
- (d) Bismuth subsalicylate, metronidazole, azithromycin and a proton pump inhibitor

70. When RBCs are kept in isotonic NaCl solution

- (a) There will not be any movement of solutes across the RBC membrane
- (b) The RBC shape and size will not change
- (c) Because the osmotic pressure across the membrane is same the solutes will not cross across the RBC membrane
- (d) All of these

71. Which statements are not true about the grafts

- A. Isografts are grafts in which the donor and recipient is the same individual
- B. Autografts are grafts between the donor and recipient of the same genotype
- C. Allografts are those in which the donor is of the same species but of a different genotype
- D. Xenografts are those in which the donor is of a different species from that of the recipient

Choose the correct answer from the options given below

- (a) A, B and D only (b) A and B (c) B and C (d) C and D

72. At the site of tissue injury, the activated platelet releases ADP and activates surrounding platelets to form platelet-plug, but this process will not continue to activate whole platelets in the body to form a massive ball of platelets because

- (a) The adjacent normal endothelial cells physiologically release 'NO' which is a platelet inhibitor
- (b) There will be plasminogen activators in the plasma
- (c) There will be plasminogen activator inhibitors in plasma
- (d) There will be a tissue plasminogen activator (tPA) which inhibits the platelets

PHARMACOGNOSY

73. Dioscin, a steroidal saponin glycoside of *Dioscorea tubers* after hydrolysis gives

- (a) Diosgenin + 3 Glucose (b) Diosgenin + 3 Rhamnose
- (c) Diosgenin + 2 Glucose + 1 Rhamnose (d) Diosgenin + 1 Glucose + 2 Rhamnose



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74. Rancidity in the fixed oils generally show

- (a) Higher Iodine value as compared to the standards
- (b) Higher Acid value as compared to the standards
- (c) Higher Peroxide value as compared to the standards
- (d) Higher level of Unsaponifiable matter

75. One of the following is an example of chemical method of evaluation

- (a) Determination of volatile oil
- (b) Determination of refractive index
- (c) Detection of alkaloids
- (d) Determination of vascular bundles

76. 'Star spots' present in the transverse section of decorticated Rhubarb rhizomes are

- (a) Lignified cells
- (b) Pericyclic fibres
- (c) Concentric vascular bundles
- (d) Crystals of calcium oxalate

77. The best quality of the Lemon oil is obtained by using

- (a) Hydrodistillation method
- (b) Extraction method
- (c) Enfleurage method
- (d) Hand press method

78. Type of alkaloids present in Colchicum

- (a) Tropane alkaloids
- (b) Steroidal glycoalkaloids
- (c) Amino alkaloids
- (d) Quinoline alkaloids

79. HPTLC analysis is useful for following types of analysis of herbal drugs

- A. Quantitative estimation of marker compound
- B. Authentication of extracts
- C. Detection of pesticides
- D. Standardization of herbal drugs

Choose the correct answer from the options given below

- (a) A, B and D only
- (b) D only
- (c) A and D only
- (d) A, B, C and

80. Anthranilic acid is an immediate precursor in the formation of

- (a) Tyrosine
- (b) Tryptophan
- (c) Ornithine
- (d) Methidine

81. Which of the above are true for Rutin

- A. Rutin is a Bioflavonoid
- B. Rutin is a flavonol glycosides
- C. Rutin is used in Capillary bleeding
- D. Rutin is used as Vitamin P

- (a) A and B only
- (b) A, B and C only
- (c) A, B and D only
- (d) All of these

82. Tropane nucleus is combination of

- (a) Pyrolidine & piperidine
- (b) Pyrolidine & pyridine
- (c) Pyrolidine & oscine
- (d) Piperidine & oscine



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CHEMISTRY

83. Stability index, determined for evaluating the stability of oil- water viscous emulsions, based on electric conductivity changes during non-destructive short heating-cooling-heating cycles,

- A. is defined as Δ/h , where h is the change in the conductivity between 35°C and 45°C and Δ is the conductivity interval within the two heating curves at 35°C
- B. indicates the relative change in enthalpy between two cycles
- C. is defined as $2\Delta/h$, where h is the change in the conductivity between 35°C and 45°C and Δ is the conductivity interval within the two heating curves at 35°C
- D. indicates the relative change in conductivity between two cycles

Choose the correct answer from the options given below

- (a) A and B only (b) B and C only (c) C and D only (d) D and A only

84. When alkenes are epoxidised with optically active peracids, optically active epoxides are formed Under the same defined conditions, epoxidation of E-but-2-ene by peroxycamphoric acid affords unequal yields of enantiomeric epoxides However, a similar epoxidation of Z-but-2-ene can only afford

- (a) Z-epoxide (b) Meso epoxide (c) E-epoxide (d) None of these

85. In the case of halogenation reaction of alkanes, abstract of primary hydrogen yields a primary radical, and abstract of secondary hydrogen yields a secondary radical The above example is of

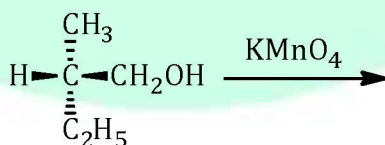


- (a) High reactivity and low selectivity (b) Low reactivity and high selectivity
 (c) High reactivity and high selectivity (d) Low reactivity and low selectivity

86. Phenol upon treatment with bromine in the presence of carbondisulphide at 0 °C yields

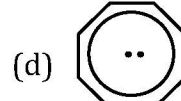
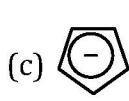
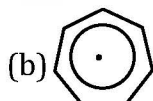
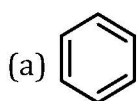
- (a) 4-Bromophenol (b) 2-Bromophenol
 (c) 2,4-Dibromophenol (d) 2,4,6-Triibromophenol

87 Identify the major product formed in the above reaction from the four choices listed below



- (a) (S)-(+)-2-methylbutanoic acid (b) (S)-(-)-2-methylbutanoic acid
 (c) (S)-(+)-2-methylbutanol (d) (S)-(-)-2-methylbutanol

88. Among the following organic compounds, the one that is non- aromatic is



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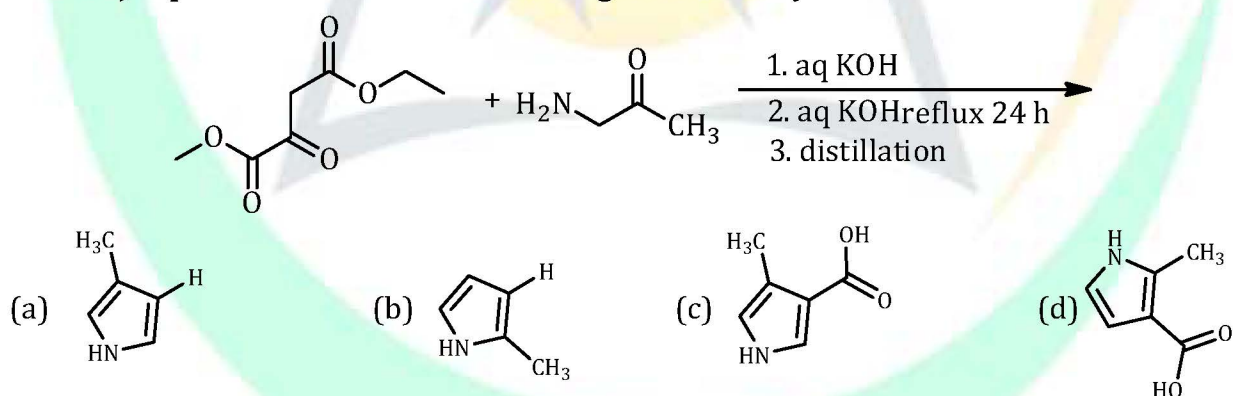
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89. Identify which statement among the following is true in case of E2 and SN2
- Secondary substitution undergoes slow elimination and fast substitution
 - Primary substitution undergoes slow elimination and fast substitution
 - Tertiary substitution undergoes slow elimination and fast substitution
 - Primary substitution does not undergo elimination and substitution reactions
90. When 100 mL of 0.1 M sodium hydroxide solution is added to 100 mL of 0.1 M acetic acid ($K_a = 1.82 \times 10^{-5}$), pH of the solution will be
- 83
 - 70
 - 38
 - 87
91. Insertion of an oxygen in a carbonyl compound to form an ester is known as
- Baeyer Villiger oxidation
 - Sharpless epoxidation
 - Prevost oxidation
 - Lossen rearrangement
92. Identify the product formed when 2-cholestene is treated with Br_2
- $5\beta, 6\alpha$ -dibromocholestane
 - $2\beta, 3\alpha$ -dibromocholestane
 - $5\alpha, 6\beta$ -dibromocholestane
 - $5\alpha, 6\beta$ -dibromo 3β -hydroxy cholestane
93. Controlled alkylation of a ketone via an enamine intermediate is named as:
- Mannich reaction
 - Robinson annulation
 - Stork reaction
 - Bamford Stevens reaction
94. The major product formed in the above-given Knorr synthesis is:



95. Heme is
- Iron containing tetrapyrrole
 - Iron containing polypeptide
 - Copper or magnesium containing tetrapyrrole
 - Iron containing imidazole
96. Isobutane upon bromination under the influence of ultraviolet light at $127^\circ C$ affords the following major product
- N-Butyl bromide
 - Isobutyl bromide
 - sec-Butyl bromide
 - ter-Butyl bromide



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97. Identify the correct descending order of strength of nucleophilic solvents from the below-given options

- (a) Trifluoroethyl alcohol, methanol, formic acid, acetic acid
 (b) Formic acid, acetic acid, methanol, trifluoroethyl alcohol
 (c) Methanol, formic acid, acetic acid, trifluoroethyl alcohol
 (d) Methanol, acetic acid, formic acid, trifluoroethyl alcohol

98. Match the statements in List I with their correct answers in List II, respectively, in respect to modified 1st law of thermodynamics, and Choose the correct answer from the options given below

LIST I	LIST II
A. Constant heat ($q = 0$)	I. Isothermal
B. Reversible process at constant temperature ($dT = 0$)	II. Isometric
C. Constant volume ($dV = 0$)	III. Adiabatic
D. Constant pressure ($dP = 0$)	IV. Isobar

- (a) A - II, B - I, C - III, D - IV
 (b) A - I, B - III, C - II, D - IV
 (c) A - III, B - I, C - II, D - IV
 (d) A - IV, B - I, C - II, D - III

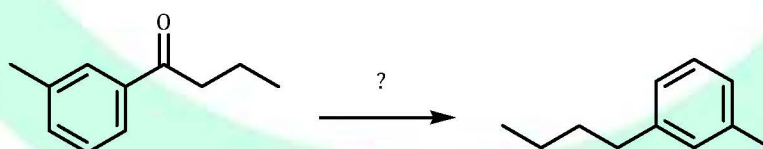
99. Ethylketazocine is a 6,7-benzomorphan derivative with receptor selectivity

- (a) Mu-opioid (b) Delta-opioid (c) Kappa-opioid (d) NOP

100. In the determination of configuration of glucose, Fischer subjected (-) arabinose to Ruff's degradation The four-carbon sugar obtained by the degradation process was:

- (a) (-) Threose (b) (+) Threose (c) (-) Erythrose (d) (+) Erythros

101. The set of specific reagents used in the above-mentioned synthesis of m-(n-Butyl) toluene from n-propyl m-tolyl ketone is

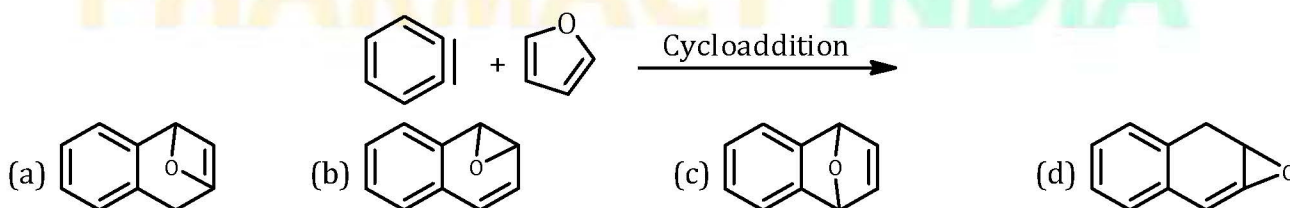


- (a) Zn(Hg), HCl (b) NaBH_4 , CH_3OH (c) NH_2NH_2 , NaOH (d) SnCl_2 , CH_3OH

102. Optically active mandelic acid can be synthesized from benzaldehyde in the presence of the enzyme

- (a) Invertin (b) Myrosin (c) Emulsin (d) Zymase

103. The major product formed in the above reaction is



Answer - B



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104. Identify the functional groups from the below mentioned options that lead to weakening of benzoic acid

A. -OH

B. -Cl

C. -NH₂

D. -NO₂

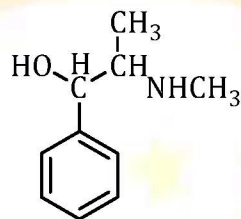
(a) A and B

(b) A and C

(c) B and C

(d) A and D

105. The above structure is of



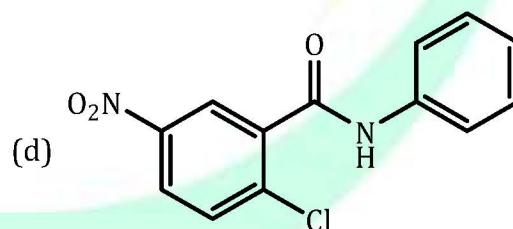
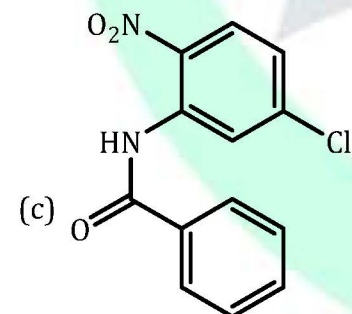
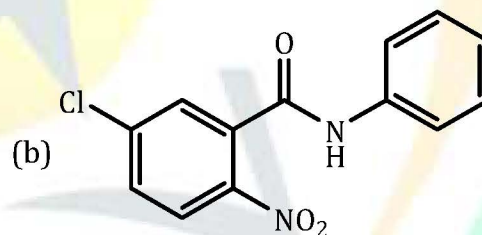
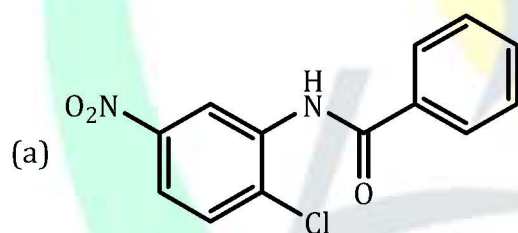
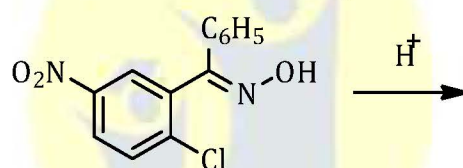
(a) Norephedrine

(b) Pseudoephedrine

(c) Ephedrine

(d) Norpseudoephedrine

106. The major product formed in the above acid-catalyzed reaction is



ANALYSIS

107. According to the $n + 1$ rule, what would be the multiplicities of the signals in the proton NMR spectrum of 1,1-dibromoethane

(a) Triplet and doublet

(b) Quartet and doublet

(c) Triplet and quartet

(d) Triplet and triplet

108. According to Mohr method, the silver nitrate solution can be standardized against primary- standard grade

(a) Sodium carbonate

(b) Sodium chloride

(c) Sodium hydrogen carbonate

(d) Sodium metabisulfite



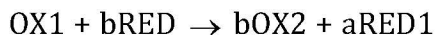
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109. Potential at the equivalence point for a redox reaction

- (a) $E = (bE_1^0 + aE_2^0)/(a+b)$ (b) $E = E^0 + (00592/n) \times \log Q$
 (c) $E = E^0 + (00592/n) \times \log (\text{Red}/\text{Ox})$ (d) $E = E_1^0 + E_2^0/2$

110. Back-titration method is used for

- A. Volatile substances
 B. Insoluble substances
 C. Substances for which a quantitative reaction proceeds rapidly only in the presence of excess of the reagent
 D. Substances that require heating with a volumetric reagent during the determination, in which decomposition or loss of the reactants would occur in the process

Choose the correct answer from the options given below

- (a) A only (b) A and C (c) A, B and D (d) A, B, C and D

111. Match List I with List II

LIST I	LIST II
BUFFERS	pH VALUE
A. HCl and KCl	I. 8 to 10
B. HCl and Potassium Hydrogen Phthalate	II. 2.2 to 4.0
C. NaOH and Potassium Hydrogen Phthalate	III. 1.2 to 2.2
D. H_3BO_3 , NaOH, and KCl	IV. 4.2 to 5.8

Choose the correct answer from the options given below

- (a) A -II, B -III, C -IV, D -I (b) A -III, B -II, C -IV, D -I
 (c) A -II, B -IV, C -I, D -II (d) A -III, B -IV, C -II, D -I,

112. Boric acid with molecular weight 61.83 was partitioned between water and amyl alcohol at 25 °C The amount of boric acid was determined to be 0.24 g in 250 ml of amyl alcohol and 0.32 g in 100 ml water The partition coefficient of boric acid between water and amyl alcohol, when calculated at molar concentration for each of the solution, is

- (a) 1.33 (b) 0.75 (c) 0.30 (d) 3.33

113. Match the symbols in the List I with the terms used in the List II of conductance measurements, and

List I	List II
SYMBOLS	TERMS
A. Ω^{-1}	I. Specific conductance
B. Λ	II. Electrical conductance
C. k	III. Specific resistance
D. ρ	IV. Equivalent conductance



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Choose the correct answer from the options given below

- (a) A - III, B - I, C - IV, D - II
 (b) A - II, B - IV, C - I, D - III
 (c) A - IV, B - II, C - III, D - I
 (d) A - I, B - III, C - II, D - IV

114. Match List I with List II, and

List I	List II
VOLUMETRIC SOLUTION	PRIMARY STANDARD
A. 0.1 M Iodine	I. Potassium iodate
B. 0.1M Sodium thiosulphate	II. Potassium bromate
C. 0.1M Sodium hydroxide	III. Potassium hydrogen phthalate
D. 0.1M Perchloric acid	IV. Arsenic trioxide
	V. Potassium hydrogen phthalate

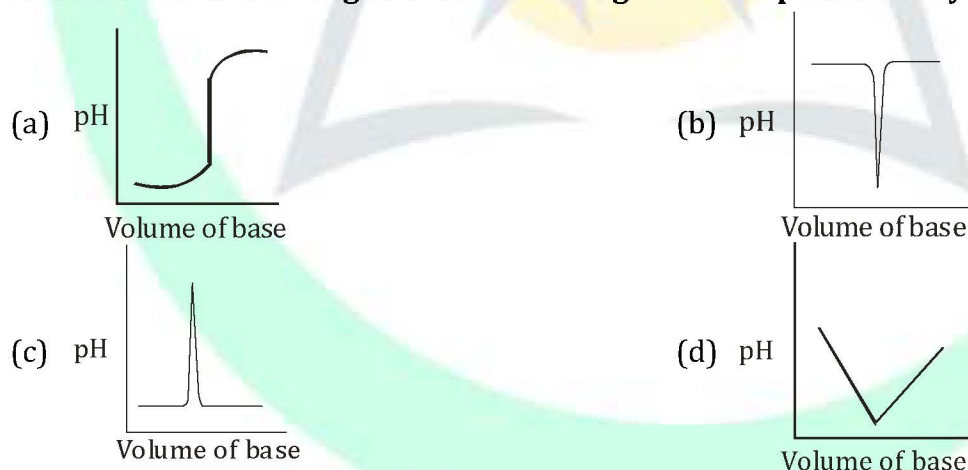
Choose the correct answer from the options given below

- (a) A - IV, B - II, C - III, D - V
 (b) A - IV, B - II, C - III, D - I
 (c) A - I, B - IV, C - II, D - III
 (d) A - III, B - II, C - IV, D - I

115. Benzene theoretically can have number of possible fundamental absorption bands in the IR spectrum

- (a) 30 (b) 15 (c) 6 (d) 0

116. The titration of a strong acid with a strong base is represented by plot



OTHER

117. Which one of the following is NOT a phospholipid

- (a) Sphingomyelin (b) Lysolecithin (c) Cardiolipin (d) Galactosylceramide

118. Citric acid cycle is the final pathway during the oxidation of

- (a) Carbohydrates (b) Lipids (c) Proteins (d) All of these

119. Given below are the two statements

Statement [I] : Glucose-6-phosphate can be formed from glucose, but not from glycogen

Statement [II] : Glucose-1-phosphate may be hydrolyzed to yield free glucose in liver

Choose the most appropriate answer from the options given below



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- (a) Both Statement I and Statement II are correct
- (b) Both Statement I and Statement II are incorrect
- (c) Statement I is correct but Statement II is incorrect
- (d) Statement I is incorrect but Statement II is correct

120. All enzymes accelerate the reaction rates by

- (a) Lowering activation energy barrier (ΔG_p) for a reaction
- (b) Denaturing the substrate
- (c) Increasing the temperature
- (d) Changing the pH

121. Match List I with List II

List I	List II
CLASSIFICATION OF BACTERIA	EXAMPLE
A. Gram positive spherical shaped nonmotile bacteria	I. <i>Clostridium tetani</i>
B. Gram positive sporulating obligate anaerobic bacteria	II. <i>Bacillus anthracis</i>
C. Gram positive rod shaped nonsporulating bacteria	III. <i>Streptococcus sp</i>
D. Gram positive sporulating rod shaped motile bacteria	IV. <i>Corynebacterium diphtheriae</i>
	V. <i>E.coli</i>

Choose the correct answer from the options given below

- (a) A - III, B - IV, C - I, D - V
- (b) A - IV, B - I, C - II, D - III
- (c) A - III, B - I, C - IV, D - II
- (d) A - I, B - IV, C - II, D - III

122. Which of the following statements are true about Prions

- A. Prion is a type of infectious protein
- B. Prions contain single stranded RNA
- C. Creutzfeldt-Jakob Disease (CJD) is not caused by Prion
- D. Prions are even more difficult to destroy than bacterial spores

Choose the correct answer from the options given below:

- (a) A, B and D only
- (b) A only
- (c) A and D only
- (d) A, C and D

123. Which of the following statements are true

- A. Bacteria are categorized underneath the Kingdom Monera
- B. Protista are unicellular and eukaryotic organisms
- C. Yeasts and molds are under kingdom Fungi
- D. Multinucleated higher fungi are under Animalia

Choose the correct answer from the options given below:

- (a) A, B and C only
- (b) B, C and D only
- (c) A and B only
- (d) C and D only

124. Given below are two statements

Statement [I] : Sequencing of DNA is much easier than RNA sequencing due to greater stability



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Statement [II] : The chemical method of DNA sequencing (Maxam & Gilbert) works for only single stranded DNA

In light of the above statements, choose the correct answer from the options given below

- (a) Both Statement I and Statement II are true
- (b) Both Statement I and Statement II are false
- (c) Statement I is true but Statement II is false
- (d) Statement I is false but Statement II is true

125. Match List I with List II

LIST I	LIST II
ANTIGEN- ANTIBODY REACTION TYPES	APPLICATION
A. Precipitin test	I. Screening for Rubella and Type2 Herpes viruses
B. Agglutination (Haemagglutination)	II. Streptococcal differentiation into serological groups
C. Complement Fixation reaction	III. Serological diagnosis of influenza & mumps viruses
D. ELISA	IV. Treponema pallidum identification
	V. Mycobacterium identification

Choose the correct answer from the options given below

- (a) A -III, B -V, C -II, D -I
- (b) A -II, B -IV, C -I, D -III
- (c) A -IV, B -II, C -III, D -I
- (d) A -I, B -III, C -II, D -IV

ANSWER KEY

1-c	2-c	3-c	4-a	5-b	6-d	7-d	8-c	9-a	10-d
11-a	12-c	13-c	14-a	15-d	16-c	17-b	18-a	19-d	20-a
21-c	22-c	23-c	24-c	25-a	26-c	27-c	28-b	29-c	30-d
31-a	32-b	33-d	34-a	35-d	36-b	37-b	38-c	39-d	40-d
41-b	42-d	43-d	44-c	45-d	46-c	47-a	48-c	49-b	50-b
51-b	52-d	53-b	54-d	55-a	56-b	57-b	58-a	59-d	60-d
61-a	62-d	63-a	64-a	65-a	66-b	67-b	68-d	69-a	70-b
71-b	72-a	73-d	74-b	75-c	76-c	77-d	78-c	79-d	80-b
81-d	82-a	83-d	84-b	85-b	86-a	87-a	88-d	89-b	90-d
91-a	92-b	93-c	94-a	95-a	96-d	97-d	98-c	99-c	100-c
101-c	102-c	103-b	104-b	105-c	106-d	107-b	108-b	109-a	110-d
111-b	112-d	113-b	114-a	115-a	116-a	117-d	118-d	119-b	120-a
121-c	122-c	123-a	124-c	125-b					



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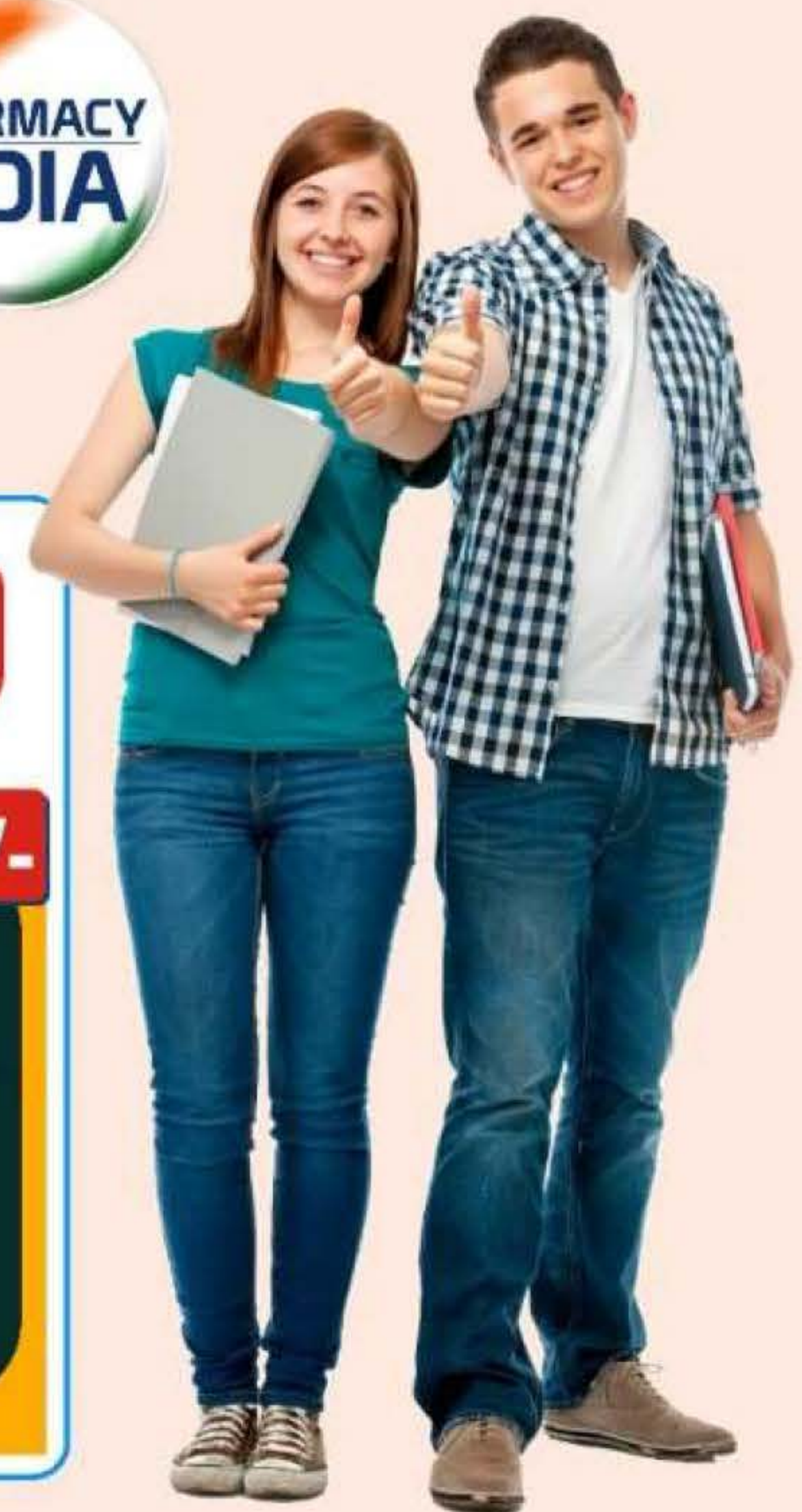
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 TAVADE AIR - 795	 DIPIN AIR - 911	 ADRIJA AIR - 958	 JOREPALLI AIR - 1022	 NITIN AIR - 1155	 K. MARI AIR - 1198

 PRIYA AIR - 1198	 AMIT AIR - 1321	 RAKESH AIR - 1361	 SEKHAR AIR - 1404	 SHEKHAR AIR - 1731	 SUDAM AIR - 1731
 SHIVAM AIR - 2020	 RUDRAWAR AIR - 2506	 NILESH AIR - 2506	 NIRANJAN AIR - 2613	 SAPTAPADI AIR - 2813	 RASHMI AIR - 3005
 SAURABHA AIR - 3005	 PRINCE AIR - 3343	 YASH AIR - 3343	 AKANSHA AIR - 3455	 K LAKSHMI AIR - 3455	 CHARANJEET AIR - 3753
 SURAJ AIR - 3753	 PRATHMESH AIR - 3870	 SHIVSHANKAR AIR - 3870	 TAPSVI AIR - 3870	 AMIT AIR - 3238	 ANIL AIR - 3870

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