

Code **A**

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**Ph. D. Entrance Test, 2023
Pharmaceutical Sciences**

Roll No. (in Figure) _____

Booklet Sr. No. _____

(in Words) _____

Time : 2 Hours

Total Questions : 100

Max. Marks : 100

(Signature of the Candidate)

(Signature of the Invigilator)

IMPORTANT

DO NOT OPEN THE BOOKLET UNLESS YOU ARE ASKED TO DO SO

FIRST READ FOLLOWING INSTRUCTIONS CAREFULLY.

1. Immediately on opening the question-booklet, the candidate should check the booklet & OMR sheet and ensure himself/herself that it contains 100 multiple choice questions (Sr. No. 1 to 100). Discrepancy, if any, should be reported by the candidate to the invigilator within 5 (five) minutes of the opening of the question booklet and should ask the invigilator for replacement.
2. **For each question, four suggested answers A, B, C, D are given. The candidate is to choose only one answer which he/she considers the correct or the best one. If candidate darkens more than one circle or cutting/overwriting/erasing (by eraser, white fluid or any other chemicals) then such answer(s) shall not be evaluated.**
3. The answers should be marked by darkening appropriate circle provided in front of the concerned serial number on the OMR Sheet only with **black/blue pen. Use of pencil is not allowed.** For instance, while answering the Question No.26 of the question booklet, the correct answer **A** or **B** or **C** or **D** at serial No. 26 of OMR sheet should only be darkened.
4. **Bringing of incriminating materials/electronic gadgets/devices including cell phone in the premises of the examination centre is strictly prohibited. Possessing of incriminating materials electronic gadgets/ devices and any other aiding material in the examination room will be a serious offence and it will attract the cancellation of the candidature.**
5. The candidate will not be permitted to leave the examination hall before the conclusion of the test. The candidate should make sure that question-booklet, OMR sheet and admit card are handed over to the invigilator before leaving the examination hall at the end of the test, failing which, a case of use of unfair-means/misbehavior will be registered against him/her, in addition to lodging of an FIR with the police. Further, OMR sheet of such a candidate will not be evaluated.
6. The candidate can do rough-work on the back of the title cover of question booklet. Rough-work on OMR sheet is **prohibited**.
7. ***Mobile Phones are not at all allowed inside the Examination Hall.***

1. An effective teaching instructional facility is one which :
(A) is colourful and good looking
(B) activates all faculties
(C) is visible to all students
(D) is easy to prepare and use
2. Which of the following is *not* a characteristic of a slow learner ?
(A) Abstract thinking (B) Limited range of interests
(C) Limited vocabulary (D) Short span of attention
3. Good evaluation of written material should not be based on :
(A) Linguistic expression
(B) Logical presentation
(C) Ability to reproduce whatever is read
(D) Comprehension of subject
4. The primary objective of using role play is :
(A) To promote the reading habit
(B) To improve the communication competence
(C) To develop acting talent
(D) To evaluate dialogue writing skills
5. Which among the following is *not* a component of effective teaching ?
(A) Questioning to check for the understanding of students
(B) Providing students with feedback
(C) Being flexible about how long it takes to learn
(D) Reactive mode of students' behaviour
6. Which of the following is defined as a systematic method of evaluating statistical data based on the results of several independent studies of the same problem ?
(A) Meta-analysis (B) Factor analysis
(C) Systematic analysis (D) None of these

7. The main purpose of personal data being kept confidential in research studies is :
- (A) To know more about private lives of participants
 - (B) For access by government authorities
 - (C) Apprehension of harm identification or disclosure of personal information
 - (D) To hide from participants what has been written about them
8. When a thesis has been submitted in order to attain a degree or related contain objective, the supervisor's certificate has been produced because :
- (A) it ensures the quality of research
 - (B) it gives name and fame of the worker
 - (C) it gives clearance from all boundation
 - (D) it ensures the authenticity of the research work
9. Which of the following statements are true ?
- (i) Seminar is more theoretical less practical
 - (ii) Seminar is more practical less theoretical
 - (iii) Workshop is more theoretical less practical
 - (iv) Workshop is more practical less theoretical
- (A) (i) and (iv)
 - (B) (i), (ii), (iii) and (iv)
 - (C) (i) only
 - (D) (iv) only
10. What does the longitudinal research approach actually deal with ?
- (A) Short-term research
 - (B) Long-term research
 - (C) Horizontal research
 - (D) Vertical research
11. Which of the following set of statements is correct for describing the human communication process ?
- (i) Non-verbal communication can stimulate ideas
 - (ii) Communication is a learnt ability
 - (iii) Communication cannot break-down
 - (iv) More communication means more effective learning by students
- (A) (i), (ii), (iii)
 - (B) (i), (ii), (iii), (iv)
 - (C) (i), (ii), (iv)
 - (D) (ii), (iii), (iv)

12. The biggest obstacle in the way of communication in a class is :
- (A) Lack in teaching aid material
 - (B) The noise out of class and other related obstacles
 - (C) Vagueness about the content of a teacher
 - (D) Excess of noise in a class
13. Which one of the following is a strategy to overcome communication barriers ?
- (A) Aggression
 - (B) Use of jargon
 - (C) Setting of ground rules
 - (D) Advance technology provision
14. All of the following are salient features of oral communication *except* :
- (A) Flexibility
 - (B) Two-way process
 - (C) Rectification facility
 - (D) One-off exercise
15. Which of the following groups has the components of paralanguage communication ?
- (A) Social Space, Voice and Impression
 - (B) Voice, Emphasis and Impression
 - (C) Voice, Social space, Expression
 - (D) Emphasis, Social Space and Voice
16. Which of the following is search engine ?
- (A) Internet
 - (B) Bing
 - (C) Skype
 - (D) Acrobat Reader
17. Software piracy refers to :
- (A) Stealing software and distributing the unlicensed copies
 - (B) Opensource software
 - (C) Gain access of a website and perform illegal activity
 - (D) Selling software online with a proper license key
18. The first web browser is :
- (A) Internet Explorer
 - (B) Netscape
 - (C) World Wide Web
 - (D) Firefox

19. The convenient place to store contact information for quick retrieval in e-mail is :
- (A) Message box (B) Message book
(C) Address box (D) Address book
20. NPTEL stands for :
- (A) National programme on technology enhanced learning
(B) National programme on technology enabled learning
(C) National programme on technology enhanced lessons
(D) National programme on technology embedded learning
21. Atmospheric pressure exerted on earth is due to :
- (A) Revolution of earth (B) Gravitational pull
(C) Rotation of earth (D) Uneven heating of earth
22. Which of the following methods would be most appropriate in reducing acid rain and acid deposition problems ?
- (A) Adding lime of the acidic lakes
(B) Reducing the use of fossil fuels
(C) Promotion of acid-resistant crops
(D) Increasing the height of smokestacks
23. At present in India, the share of which of the following sources of energy in electricity generation is the least ?
- (A) Thermal (B) Solar and wind
(C) Nuclear (D) Hydro
24. Sustainable development goals are to be achieved by which of the following years ?
- (A) 2025 (B) 2030
(C) 2035 (D) 2050

25. Which of the following pollutants is included in the Air Quality Index in India ?
- (A) Carbon dioxide (B) Chlorofluorocarbon
(C) Methane (D) Sulphur dioxide
26. Which of the following satellite channels was launched on 26th January, 2003 for the spread of technical growth and development of distance education in India ?
- (A) Eklavya (B) Dronacharya
(C) Gyan Darshan (D) Gyan Vani
27. Which of the following is an online storehouse of all academic awards like certificates, diplomas, degrees, mark sheets etc. ?
- (A) SWAYAM (B) National Digital Library
(C) National Academic Library (D) National Academic Depositor
28. Deemed universities declared by UGC under Section 3 of the UGC Act, 1956 are *not* permitted to :
- (A) offer programmes in higher education and issue degrees
(B) give affiliation to any institute of higher education
(C) open off-campus and off-shore campus anywhere in the country and overseas respectively without the permission of the UGC
(D) offer distance education programmes without the approval of the Distance Education Council
29. Which of the following does *not* include in the Council of Ministers ?
- (A) Cabinet Minister (B) Deputy Minister
(C) President (D) Prime Minister
30. In the context of value education, which of the following stages will be considered a relatively advanced stage ?
- (A) Value collection through imitation
(B) Value assessment through inner evaluation
(C) Value clarification through exposure
(D) Value consolidation through integration

31. 80, 10, 70, 15, 60,..... What number should come next ?
(A) 20 (B) 25
(C) 30 (D) 50
32. Complete the series :
BB, FE, II, NL, PP,
(A) TS (B) ST
(C) RS (D) SR
33. Deepak said to Nitin, "That boy playing with the football is the younger of the two brothers of the daughter of my father's wife." How is the boy playing football related to Deepak ?
(A) Son (B) Brother
(C) Cousin (D) Brother-in-law
34. Find the odd one that *does not* belong to the group :
(A) Zinc (B) Bronze
(C) Silver (D) Platinum
35. If 'DELHI' is coded as '73541' and 'CALCUTTA' as '82589662', how will 'CALICUT' be coded ?
(A) 5279431 (B) 5978213
(C) 8251896 (D) 8544391
36. Which of the following has the same relationship as
Sailor : Compass ::?
(A) Student : Exam (B) Doctor : Stethoscope
(C) Pen : Officer (D) Painter : Artist
37. Which of the following describes a valid deductive argument with true premises ?
(A) Fallacious (B) Ambiguity
(C) Sound (D) Unsound

38. If the statement 'some men are cruel' is false, which of the following statements is/are true ?
- (i) All men are cruel.
 - (ii) No men are cruel.
 - (iii) Some men are not cruel.
- (A) (i) and (ii) (B) (i) and (iii)
(C) (ii) and (iii) (D) (iii) only

Direction for Question Nos. 39 to 45 : Refer to the following table and solve the questions based on it :

The following table shows the domestic sales of cars of five manufacturers from 1995 to 2000. (All the figures are in thousands)

Manufacturer	1995	1996	1997	1998	1999	2000
A	440	480	470	500	520	510
B	400	410	415	415	420	430
C	380	390	390	400	420	495
D	360	380	400	415	440	500
E	480	440	440	420	425	435

39. Considering the period given, state the domestic sales of which manufacturer is the highest ?
- (A) A (B) B
(C) C (D) D
40. During 1996, what is the approximate share of domestic sales of cars of the manufacturer B ?
- (A) 10.5% (B) 25.5%
(C) 15.5% (D) 19.5%
41. During 2000, the sales of which manufacturer has shown the maximum percentage increase over the previous year ?
- (A) A (B) B
(C) C (D) D
42. With respect to which of the following combinations is the sales of cars the highest over the given period ?
- (A) D, 2000 (B) A, 1998
(C) A, 2000 (D) A, 1999

43. Which of the following manufacturers, has a consistent increase across the years given ?
- (A) A (B) B
(C) C (D) D
44. How many of the manufacturers have never shown a decline in the number of cars sold in any particular year over the previous year ?
- (A) 1 (B) 2
(C) 3 (D) 4
45. How many times have the number of cars sold been more than 450 for any manufacturer in any year more than once ?
- (A) 6 (B) 7
(C) 8 (D) 9

Direction for Q. Nos. 46 to 50 : Read the following passage and answer the questions given below it :

The stock-taking done at the first national convention on consumer protection served to highlight the areas that called for special attention to sustain the momentum of the movement as genuine forum for safeguarding the people's interests. Spreading awareness about the rights of the consumers and the relief open to them in case they did not get their money's worth of goods and services has rightly been identified as the first priority. While this may not be a difficult task in urban areas, where the movement is concentrated at present, taking it to the vast rural hinterland calls for a multi-media approach in which radio and television have a crucial role to play. The involvement of the 500-odd consumer organisations in the country in publicising the concept of fair trade practices and the remedies available against their violation will prove rewarding, if the message is conveyed through village bodies.

Government efforts remain confined at best to setting up the infrastructure after the formal launch of the movement with the enactment of the Consumer Protection Act. The mounting backlog of cases in consumer courts, points to the need for toning up the district level redressal machinery.

The main objective of the movement is the creation of a culture that denies place in the market for products that are not consumer friendly. This is possible only if consumer bodies take over the watchdog role performed by the Government till now and exercise social control over the market to see that the benefits of liberalisation are not reaped by traders alone. But the plea to industry to exercise self-regulation and maintain minimum standards of quality and devise appropriate pricing is bound to go unheeded unless strict measures are taken to ensure compliance.

46. The first national convention on Consumer Protection has :
- (A) highlighted the areas for special attention.
 - (B) spread awareness about consumer rights
 - (C) specified in relief open to the consumer
 - (D) given it a momentum
47. Consumer Protection Act proposes to give the consumer protection against :
- (A) highly priced substandard goods
 - (B) cheating by selling substandard goods
 - (C) not getting his money's worth
 - (D) denial of relief if the product is not upto the mark
48. Government contributed to the Consumer Protection Movement by :
- (A) toning up a district level redressal machinery
 - (B) clearing the backlog cases in the Consumer Court
 - (C) setting by infrastructure
 - (D) enactment of the Consumer Protection Act
49. Spreading Consumer Protection Movement to the rural areas needs :
- (A) official patronage
 - (B) a multi-media approach
 - (C) consumer organisation to canvass this
 - (C) message to be conveyed by village bodies
50. Role of consumer bodies is :
- (A) To maintain minimum standards of quality
 - (B) To function as a watchdog
 - (C) To make a plea to industry to exercise self-control
 - (D) To exercise social control over the market

51. Omeprazole is an :
(A) Anti-ulcer (B) Anti-histaminic
(C) Antacid (D) Anti-diarrhoeal
52. Unit of Kinematic Viscosity is :
(A) Poise (B) Pascles
(C) Stokes (D) Cm/sec
53. Identify the toxic Umbelliferous plant :
(A) *Veratrum viride* (B) *Pimpinella anisum*
(C) *Conium maculatum* (D) *Abrus precatorius*
54. Choose the FALSE statement :
(A) Enzymes do not alter the equilibrium constant and both the forward and reverse reactions are affected by the same amount
(B) Michaelis-Menten constant (K_m) is the substrate concentration required for an enzyme to reach three-fourths of its maximum reaction rate
(C) Each enzyme has a characteristic K_m for a given substrate
(D) An inactive enzyme without the cofactor is called an apoenzyme
55. High resolution mass helps to :
(A) Establish the molecular formula
(B) Establish the empirical formula
(C) Analyse the base peak
(D) Analyse the molecular ion peak
56. Which of the following is NOT an ester ?
(A) Procaine (B) Lignocaine
(C) Benzocaine (D) Cocaine
57. Which of the following is an import commodity for India ?
(A) Senna (B) Isabagol
(C) Ginseng (D) Menthol

58. If a drug has a half life of 7 h, after how much time can the drug be assumed to have eliminated (> 99%) from the body ?
- (A) 0.099 h (B) 70 h
(C) 49 h (D) 14 h
59. Volume of distribution for a drug is :
- (A) Sum of intracellular and extracellular volumes
(B) Total blood volume
(C) Ratio of drug dose to initial plasma drug level
(D) Ratio of body weight to body density
60. Which of the following drugs is assayed by non-aqueous titrations ?
- (A) Acetazolamide (B) Amantadine
(C) Aspirin (D) Calcium gluconate
61. Choose the FALSE statement :
- (A) Fatty acids are important for energy storage and signaling pathways
(B) Beta oxidation splits carbon chains of the fatty acid into acetyl CoA, which then can enter the TCA cycle
(C) Polyunsaturated fatty acids are used in the biosynthesis of some prostaglandins
(D) Linoleic acid is not an essential fatty acid
62. What is NOT TRUE for Cardiac glycosides ?
- (A) Contain lactone ring and hydroxyl groups
(B) Are steroidal compounds
(C) Are not reported from animals
(D) Have positive inotropic effect

63. Choose the right combination :

- | | |
|---------------------|------------------------|
| 1. Suspending agent | i. Calcium carbonate |
| 2. Diluent | ii CMC |
| 3. Adsorbent | iii Diatomite |
| 4. Filter aid | iv Magnesium carbonate |

- (A) 1 & ii, 2 & i, 3 & iv, 4 & iii
(B) 1 & i, 2 & ii, 3 & iv, 4 & iii
(C) 1 & iv, 2 & ii, 3 & iii, 4 & i
(D) 1 & i, 2 & ii, 3 & iii, 4 & iv

64. What is NOT TRUE for tannins ?

- (A) are polyphenolic substances detected by goldbeater's skin test
(B) produce colour reaction with ferric chloride solution
(C) condensed tannins resist hydrolysis
(D) have restricted distribution in plants

65. Exemestane inhibits the enzyme :

- (A) 5-alpha reductase (B) 3-beta-hydroxydehydrogenase
(C) Aromatase (D) 17-alpha hydroxylase

66. Sumatriptan is :

- (A) 5HT_{1B/1D} agonist (B) 5HT_{1D} antagonist
(C) 5HT₂ agonist (D) 5HT₃ antagonist

67. Name the agent which acts as a self-indicator :

- (A) Methyl orange (B) Potassium permanganate
(C) Phenolphthalein (D) Thymolblue

68. Assymmetric centres of cyclopentanoperhydrophenanthrene ring are present at positions :

- (A) 6, 9, 10, 12 and 14 (B) 5, 8, 9, 10, 13 and 14
(C) 6, 8, 9, 10, 13 and 14 (D) 6, 8, 9, 10, 12 and 14

69. Which of the following anti-diabetic is preferred in obese patients ?
- (A) Voglibose (B) Pioglitazone
(C) Glibenclamide (D) Metformin
70. Non-sedative antihistaminics are :
- (A) Promethazine and cyclizine
(B) Chlorpheniramine and trimeprazine
(C) Diphenhydramine and promethazine
(D) Cetrizine and astemizole
71. The recommended dose of chloroquine phosphate in the treatment of malaria is :
- (A) 650 mg 3 times a day for 3-7 days
(B) 100 mg twice daily for 7 days
(C) 500 mg 3 times a day for 5 days
(D) 1000 mg followed by 500 mg at 6, 24, 48 h after initial dose
72. Phase I clinical trials are normally conducted in :
- (A) 10-20 healthy volunteers
(B) 20-100 healthy volunteers
(C) 20-100 people with the disease/condition
(D) 100-200 healthy volunteers or people with the disease/condition
73. Find the TRUE statement :
- (A) In eukaryotic cells, the citric acid cycle occurs in the cytosol and in prokaryotic cells TCA reaction sequence is performed in the mitochondrion
(B) The citric acid cycle consumes acetate and water, oxidizes NADH to NAD⁺ and generates carbon dioxide as a waste
(C) During glycolysis, sugars yield pyruvate which in turn is decarboxylated by the enzyme pyruvate dehydrogenase generating acetyl-CoA
(D) Four Krebs cycles are required for complete utilization of one glucose molecule

74. Find the FALSE statement :
- (A) Each cubic millimetre of blood contains 40-60 million erythrocytes
 - (B) RBCs circulate around the body for upto 120 days
 - (C) Old RBCs are removed by macrophages in the spleen and liver
 - (D) In humans, the mature RBC lacks a nucleus
75. Which of the following is *not* related to dose calculation in pediatric ?
- (A) Nomogram Method
 - (B) Newman Formula
 - (C) Young's Rule
 - (D) Clark's Rule
76. Cocoa butter has the following number of polymorphs :
- (A) 4
 - (B) 6
 - (C) 8
 - (D) 12
77. Which of the following result in a decrease in the interfacial tension between an aqueous solution and an oil ?
- (A) Tragacanth
 - (B) Tween 20
 - (C) Magnesium hydroxide
 - (D) All of these
78. Which of the following exhibits of solution *does not* fall under colligative property ?
- (A) Boiling point elevation
 - (B) Freezing point depression
 - (C) Ultraviolet absorption
 - (D) Osmotic pressure
79. What is NOT TRUE for Karl-Fisher reagent ?
- (A) Karl-Fisher reagent is a mixture of an alcohol, a base, SO₂ and I₂
 - (B) Ethanol is used as an alcohol in the Karl-Fisher reagent
 - (C) It is used in Coulometric or Volumetric titration
 - (D) The method uses one mole of iodine per mole of water
80. What is NOT TRUE for mutations ?
- (A) Mutations are permanent, transmissible changes to the genetic material
 - (B) Mutations are induced by exposure to radiations and chemicals
 - (C) Mutations are unpredictable due to the influence of a random variable
 - (D) Mutations are not lost by genetic drift

81. What is NOT TRUE for Mannich reaction ?
- (A) It forms Schiff base
 - (B) It involves secondary and tertiary amines
 - (C) It starts with the nucleophilic addition of an amine to a carbonyl group
 - (D) The reaction is named after the German chemist
82. Find the WRONG statement :
- (A) Alcoholic or hydroalcoholic vehicles are useful for the manufacture of liniments for rubefacient action
 - (B) Liniments must never be taken internally and are not applied to broken or bruised skin
 - (C) Suppositories are used in rectum, vagina or urethra
 - (D) Pharmaceutically a pill is a tablet
83. In the preparation of multi-layered tablets, which of the following is used for hydrophilic matrix coating ?
- (A) Shellac
 - (B) CMC
 - (C) Eudragit
 - (D) Bees wax
84. For pressurized metered dose inhalers (pMDI) which of the following is NOT true ?
- (A) pMDI emit aerosols at high velocity
 - (B) pMDI use liquefied gases as propellants
 - (C) pMDI may be formulated as solutions or suspensions
 - (D) pMDI cannot be used with spacers
85. A tablet releases the drug after 5 hours. What will be the site for the drug release in the GI tract assuming the normal gastric emptying of the dosage form ?
- (A) Stomach
 - (B) Small intestine
 - (C) Colon
 - (D) Pass as such from the body

86. The main ingredient of toothpaste for sensitive tooth is :
- (A) Calcium carbonate (B) Sodium fluoride
(C) Triclosan (D) Potassium acesulfame
87. One tablet out of 6 tablets of a batch failed to disintegrate in the specified time as per IP in the disintegration test. What will be the fate of the batch?
- (A) Batch passes the disintegration test
(B) Batch fails the disintegration test
(C) Disintegration test should be repeated with additional 12 tablets
(D) Disintegration test should be repeated with additional 18 tablets
88. Cleanroom environment (class 100) refers to :
- (A) Environment with less than 100 air particles of all sizes
(B) Environment with less than 1000 air particles of all sizes
(C) Environment with less than 100 air particles of 0.5 micrometer and less than 3500 particles of 0.1 micrometer
(D) Environment with less than 1000 air particles of 0.5 micrometer and less than 100 particles of 0.1 micrometer
89. Which of the following techniques is used to improve the bioavailability of a poorly soluble drug ?
- (A) Hydrotrophy
(B) Inclusion complexation with β -cyclodextrin
(C) Nanoemulsion formation
(D) All of the above
90. The volume of a liquid drop is dependent upon a number of factors, even then a pharmacist assumes the approximate volume of a drop is :
- (A) 0.05 ml (B) 0.08 ml
(C) 0.10 ml (D) 0.15 ml

91. Caffeine alkaloid, present in tea and coffee :

- i. produces diuresis
- ii. is a pseudoalkaloid
- iii. tests positive in murexide test
- iv. is also present in cocoa and cola seeds

Choose the answer from the following options :

- (A) i & ii
- (B) i to iv
- (C) ii & iv
- (D) i to iii

92. Proteins are detected by :

- (A) Benedict's test
- (B) Kedde's test
- (C) Wagner's reagent
- (D) Millon's reagent

93. Biosynthesis of sterols proceeds through :

- (A) Mevalonic acid
- (B) Shikimic acid
- (C) Amino acids
- (D) Malonic acid

94. In a thermogravimetric analysis :

- (A) The change in physical state is measured as a function of temperature
- (B) The loss of crystallinity is measured as a function of temperature or time
- (C) The chemical changes are measured as a function of temperature
- (D) The mass of a sample is measured as a function of temperature or time

95. A potentiometric measurement *does not* require :

- (A) Chemical indicator
- (B) Indicator electrode
- (C) Reference electrode
- (D) Potential measuring device

96. A normal gastric residence time is :
- (A) Less than 60 min (B) More than 3 h
(C) Between 5 to 10 min (D) Between 2 to 3 h
97. Choose the right combination :
- (A) Quinine, antimalarial, indole alkaloid
(B) Reserpine, antihypertensive, indole alkaloid
(C) Quantitative microscopy, stomatal number, myrrh
(D) Palmitic acid, salicylic acid, fatty acid
98. Dihydropyridines belong to class of cardiovascular agents and are :
- (A) Beta-adrenergic blocking agents
(B) Diuretics
(C) ACE inhibitors
(D) Calcium channel blockers
99. Deficiency of calciferol is related to :
- (A) Rickets (B) Scurvy
(C) Anaemia (D) Impaired clotting
100. Identify INCORRECT combination of neurotransmitters :
- (A) Acetylcholine, dopamine and gamma-aminobutyric acid
(B) Glutamate, histamine and norepinephrine
(C) Serotonin, histamine and dopamine
(D) Epinephrine, ephedrine and acetylcholine