

2016.

Set No. : 1

Question Booklet No.

**RET/16/TEST-B****606****Medicinal Chemistry***(To be filled up by the candidate by blue/black ball point pen)*

Roll No.

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Roll No. (Write the digits in words) .....

Serial No. of OMR Answer Sheet .....

Day and Date .....

( Signature of Invigilator )

**INSTRUCTIONS TO CANDIDATES***(Use only blue/black ball-point pen in the space above and on both sides of the Answer Sheet)*

1. Within 30 minutes of the issue of the Question Booklet, Please ensure that you have got the correct booklet and it contains all the pages in correct sequence and no page/question is missing. In case of faulty Question Booklet, Bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall *except the Admit Card without its envelope.*
3. *A separate Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided.*
4. Write your Roll Number and Serial Number of the Answer Sheet by pen in the space provided above.
5. *On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.*
6. *No overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR sheet and Roll No. and OMR sheet no. on the Question Booklet.*
7. *Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.*
8. *This Booklet contains 40 multiple choice questions followed by 10 short answer questions. For each MCQ, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the Answer Sheet. For answering any five short Answer Questions use five Blank pages attached at the end of this Question Booklet.*
9. For each question, darken only **one** circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. *Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero marks).*
11. For rough work, use the inner back pages of the title cover and the blank page at the end of this Booklet.
12. *Deposit both OMR Answer Sheet and Question Booklet at the end of the Test.*
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

Total No. of Printed Pages : 20

35.

**ROUGH WORK**

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## Research Entrance Test-2016

No. of Questions : 50

प्रश्नों की संख्या : 50

Time : 2 Hours

Full Marks : 200

समय : 2 घण्टे

पूर्णाङ्क : 200

**Note: (1)** This Question Booklet contains **40** Multiple Choice Questions followed by **10** Short Answer Questions.

इस प्रश्न पुस्तिका में **40** वस्तुनिष्ठ व **10** लघु उत्तरीय प्रश्न हैं।

**(2)** Attempt as many MCQs as you can. Each MCQ carries **3 (Three)** marks. **1 (One)** mark will be deducted for each incorrect answer. **Zero** mark will be awarded for each unattempted question. If more than one alternative answers of MCQs seem to be approximate to the correct answer, choose the closest one.

अधिकाधिक वस्तुनिष्ठ प्रश्नों को हल करने का प्रयत्न करें। प्रत्येक वस्तुनिष्ठ प्रश्न **3 (तीन)** अंकों का है। प्रत्येक गलत उत्तर के लिए **1 (एक)** अंक काटा जायेगा। प्रत्येक अनुत्तरित प्रश्न का प्राप्तांक शून्य होगा। यदि वस्तुनिष्ठ प्रश्नों के एकाधिक वैकल्पिक उत्तर सही उत्तर के निकट प्रतीत हों, तो निकटतम सही उत्तर दें।

**(3)** Answer only **5** Short Answer Questions. Each question carries **16 (Sixteen)** marks and should be answered in **150-200** words. Blank **5 (Five)** pages attached with this booklet shall only be used for the purpose. Answer each question on separate page, after writing Question No.

केवल **5 (पाँच)** लघुउत्तरीय प्रश्नों के उत्तर दें। प्रत्येक प्रश्न **16 (सोलह)** अंकों का है तथा उनका उत्तर **150-200** शब्दों के बीच होना चाहिए। इसके लिए इस पुस्तिका में लगे हुए सादे **5 (पाँच)** पृष्ठों का ही उपयोग आवश्यक है। प्रत्येक प्रश्न का उत्तर एक नए पृष्ठ से, प्रश्न संख्या लिखकर शुरू करें।

**01.** The redactor of Agnivesha Tantra is :

- |                |                |
|----------------|----------------|
| (1) Dalhana    | (2) Charaka    |
| (3) Chakrapani | (4) Dridhabala |

**02.** The first samhita to describe Phirangaroga :

- |                           |                           |
|---------------------------|---------------------------|
| (1) Sharangadhara Samhita | (2) Charaka Samhita       |
| (3) Sushruta Samhita      | (4) Bhava Prakash Samhita |

**03.** Rashi Purusha is associated with :

- |               |               |
|---------------|---------------|
| (1) 24 Tatvas | (2) 20 Tatvas |
| (3) 4 Tatvas  | (4) 2 Tatvas  |

**04.** The number of Tantra yuktis is :

- |        |        |        |        |
|--------|--------|--------|--------|
| (1) 42 | (2) 36 | (3) 58 | (4) 60 |
|--------|--------|--------|--------|

**05.** Kanaka is the synonym of :

- |                   |              |
|-------------------|--------------|
| (1) Swarnaksheeri | (2) Chitraka |
| (3) Dhatura       | (4) Haritaki |

**06.** The number of gunas of a visha is :

- |       |       |        |        |
|-------|-------|--------|--------|
| (1) 8 | (2) 7 | (3) 16 | (4) 10 |
|-------|-------|--------|--------|

07. The number of Adharanceya vega is :

- (1) 13                      (2) 10                      (3) 8                      (4) 6

08. The synonym of Nidana is :

- (1) Samsthana                      (2) Vyanjana  
(3) Utthana                      (4) Jati

09. The shape of Dristi in Netra is that of :

- (1) Rajika                      (2) Masuradala  
(3) Sarshapa                      (4) Masha

10. According to Sushruta the number of varieties of Mudha garbha gati is :

- (1) 4                      (2) 6                      (3) 8                      (4) 2

11. The source of blood glucose during the early stages of starvation (i.e. 8 to 16 hours) is primarily :

- (1) muscle glycogen  
(2) liver glycogen  
(3) amino acids from the breakdown of protein  
(4) fatty acids from triacylglycerols in adipose tissue

12. Which of the following cholesterol derivatives is the most soluble in water ?

- (1) Cholesterol                      (2) A cholesteryl ester  
(3) Sodium cholate                      (4) Ergosterol

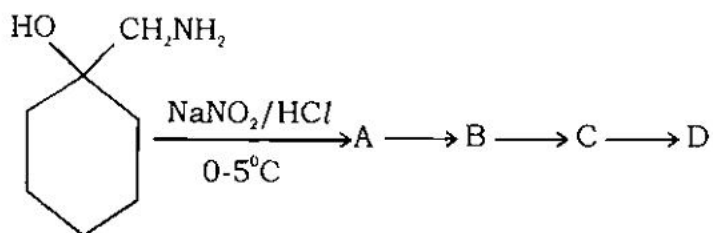
13. Which statement about reactions catalyzed by transaminases (aminotransferases) is false ?
- (1) Ammonia is liberated
  - (2) The reaction involves a Schiff base intermediate
  - (3) the reactions are important for the biosynthesis of non-essential amino acids
  - (4) The equilibrium constant is close to 1
14. Which is LEAST likely to be characteristic of a regulated enzyme in a metabolic pathway ?
- (1) Catalyzes the slowest step of the pathway
  - (2) Has a short half-life *in vivo*
  - (3) Concentration is hormonally regulated
  - (4) Catalyzes a physiologically reversible reaction
15. All of the following are likely to occur after ingestion of a very large amount of carbohydrate EXCEPT :
- (1) the synthesis of triacylglycerol in the liver
  - (2) the synthesis of glycogen in the liver
  - (3) the oxidation of glucose by the pentose phosphate pathway in liver
  - (4) lipolysis in adipose tissue
16. International Unit (IU) of enzyme can be defined as the amount of substrate converted to product at a rate of :
- |                     |                     |
|---------------------|---------------------|
| (1) 1 micromole/min | (2) 1 micromole/sec |
| (3) 1 millimole/min | (4) 1 millimole/sec |
17. Following methods can be used to estimate the molecular weight of a protein EXCEPT :
- (1) sucrose density gradient centrifugation
  - (2) ion exchange chromatography
  - (3) SDS (sodium dodecyl sulfate) gel electrophoresis
  - (4) gel filtration chromatography

18. An enzyme affects the rate of a chemical reaction by :
- (1) decreasing the free energy of the reaction
  - (2) increasing the free energy of the reaction
  - (3) lowering the energy of activation of the reaction
  - (4) raising the energy of activation of the reaction
19. Which is NOT true about Mutations in DNA :
- (1) Mutations are important if they are in intron sequences
  - (2) Mutations are not important if they occur in open reading frames
  - (3) Mutations always have a negative impact on the gene product affected
  - (4) Mutations can change the translational reading frame of proteins
20. The sequence of the complementary DNA strand for DNA with the sequence 5'-ATCGTACCGTTA-3' is :
- (1) 5'-TAGCATGGCAAT-3'
  - (2) 5'-ATCGTACCGTTA-3'
  - (3) 5'-TAACGGTACGAT-3'
  - (4) 5'-ATTGCCATGCTA-3'
21. The common principle involved in Paper chromatography technique is :
- (1) Adsorption
  - (2) Partition
  - (3) Ion exchange
  - (4) Size exclusion
22. According to Lambert's law, intensity of absorption of monochromatic light by a homogeneous preparation depends on :
- (1) temperature of preparation
  - (2) viscosity of preparation
  - (3) concentration of preparation
  - (4) thickness of preparation (path length)

- 23.** Most common carrier gas that used in Gas chromatography study is :
- (1) Hydrogen (2) Nitrogen  
(3) Helium (4) Oxygen
- 24.** In Mass Spectroscopy, most intense ion is assigned an abundance of 100, and it is referred to as :
- (1) Molecular Ion Peak (2) Base Peak  
(3) Metastable Ion Peak (4) Rearrangement Ion Peak
- 25.** Chemically, Pencillin antibiotic contains the nucleus :
- (1) oligosaccharide (2) beta-lactum  
(3) lactone ring (4) quinolone
- 26.** The chemical test recommended for identification of flavonoids is :
- (1) Mayer's test (2) Baljet test  
(3) Keller kiliani test (4) Shinoda test
- 27.** In Infra Red (IR) spectroscopic study, the characteristic wave number for stretching vibration of carbonyl functional groups is :
- (1) 675–1000  $\text{cm}^{-1}$  (2) 1080-1360  $\text{cm}^{-1}$   
(3) 1600-1900  $\text{cm}^{-1}$  (4) 2100-2260  $\text{cm}^{-1}$
- 28.** The named reaction in which diene (a molecule with two alternating double bonds) and a dienophile (an alkene) to make rings and bicyclic compounds is :
- (1) Bacyer - Villiger oxidation (2) Claisen condensation  
(3) Friedel-Crafts alkylation (4) Diels-Alder reaction



29. The antagonist of analgesic morphine alkaloid of *Papaver somniferum* is :
- (1) Nalorphine (2) Levorphanol  
(3) Codeine (4) Hydromorphone
30. The reaction mechanism involved in nitration of benzene is :
- (1) Electrophilic substitution reaction  
(2) Nucleophilic substitution reaction  
(3) Electrophilic addition reaction  
(4) Nucleophilic addition reaction
31. The color of  $[\text{Ti}(\text{H}_2\text{O})_6]^{3+}$  is purple due to :
- (1) p-d transition of electrons  
(2) d-d transition of electrons  
(3) p-p transition of electrons Proton abstraction  
(4) s-p transition of electrons
32. Which of the following ions will be most effective in an  $\text{SN}^2$  displacement on  $\text{CH}_3\text{Br}$  ?
- (1)  $\text{C}_2\text{H}_5\text{O}^-$  (2)  $\text{HO}^-$  (3)  $\text{C}_6\text{H}_5\text{O}^-$  (4)  $\text{CH}_3\text{COO}^-$
33. The end product (D) of reaction given below is :



- (1) Cyclohexanone (2) Cyclopentanone  
(3) Cycloheptanone (4) Cyclohexanol

34. Addition of oxygen to anthracene in presence of light is known as :

- (1) Norrish type reaction
- (2) photochemical addition
- (3) photochemical reduction
- (4) photochemical oxidation

35. Elements of s-block have :

- (1) high electronegative and low electropositive character
- (2) high electronegative and high electropositive character
- (3) low electronegative and high electropositive character
- (4) low electronegative and low electropositive character

36. Which of the following is **not** used in Friedel-Craft reaction ?

- (1) Phenyl acetanilide
- (2) Benzene
- (3) Chlorobenzene
- (4) Bromobenzene

37. Aspirin is obtained by a reaction of  $\text{CH}_3\text{COCl}$  with :

- (1) benzaldehyde
- (2) phenol
- (3) salicylic acid
- (4) benzoic acid

38. Primary amines can be distinguished from secondary and tertiary amines by :

- (1) Liebermann's nitroso reaction
- (2) Carbylamine reaction
- (3) Reaction with Grignard reagent
- (4) action of sodium on them

**39.** Nicotine is a derivative of :

- |               |                  |
|---------------|------------------|
| (1) Pyridine  | (2) Pyrimidine   |
| (3) Quinoline | (4) Isoquinoline |

**40.** Which one of the following, when ingested, will block glycolysis ?

- |                   |                   |
|-------------------|-------------------|
| (1) Oligomycin    | (2) Dinitrophenol |
| (3) Atractyloside | (4) Fluoride      |

**Short Answer Questions**

**Note:** Attempt any **five** questions. Write answer in **150-200** words. Each question carries **16** marks. Answer each question on separate page, after writing Question Number.

- 01.** What is alkaloid ? Write briefly about identification test of alkaloids.
- 02.** What is TLC ? Write about procedure involved in TLC study for the development of chromatogram.
- 03.** Write a short note on applications of Grignard reagent.
- 04.** Write a short note on Aldol condensation.
- 05.** How will you differentiate between following by NMR spectroscopy ?
  - (a) benzene and acetone
  - (b) nitrobenzene and nitromethanol
- 06.** Assuming they have equal affinity for the enzyme, why would a noncompetitive inhibitor be a more effective drug than a competitive inhibitor ?
- 07.** What is Beer-Lambert Law ? What are their limitations ?
- 08.** Lipids are hydrophobic material. How are they transported in blood plasma ? Mention the names of different types of lipoproteins found in blood plasma.

- 09.** Differentiate between fibrous and globular protein. Give an example of each of these proteins.
- 10.** Briefly describe the fate of pyruvate under different metabolic conditions.

Question No.

Page for Short Answer

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Question No.

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Question No.

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## अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली-काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 30 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई गलत छूटा नहीं है। पुस्तिका दोषग्रस्त पाये जाने पर दृष्टी मूल्यांकन कक्ष-निरीक्षक को देकर अपूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।
2. परीक्षा भवन में लिफाफा रहित प्रवेश-पत्र के अतिरिक्त, लिखा या सादा कोई भी खुला कागज साथ में न लायें।
3. उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा उत्तर-पत्र नहीं दिया जायेगा। केवल उत्तर-पत्र का ही मूल्यांकन किया जायेगा।
4. अपना अनुक्रमांक तथा उत्तर-पत्र का क्रमांक प्रथम आवरण-पृष्ठ पर पेन से निर्धारित स्थान पर लिखें।
5. उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।
6. ओ० एम० आर० पत्र पर अनुक्रमांक संख्या, प्रश्नपुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्नपुस्तिका पर अनुक्रमांक और ओ० एम० आर० पत्र संख्या की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।
7. उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्रयोग माना जायेगा।
8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिए आपको उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।
9. प्रत्येक प्रश्न के उत्तर के लिए केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेगा।
10. ध्यान दें कि एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो संबंधित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।
11. रफ कार्य के लिए प्रश्न-पुस्तिका के मुखपृष्ठ के अंदर वाला पृष्ठ तथा उत्तर-पुस्तिका के अंतिम पृष्ठ का प्रयोग करें।
12. परीक्षा के उपरान्त केवल ओ एम आर उत्तर-पत्र परीक्षा भवन में जमा कर दें।
13. परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।
14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भागी होगा/होगी।