

Set No. : 1

2016.

Question Booklet No.

RET/16/TEST-B

656

Physiology

(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

45.

SEAL

ROUGH WORK

रफ़ कार्य

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.** Which of the following is not synthesized in postganglionic sympathetic neuron ?
- | | |
|--------------------|-----------------|
| (1) L-DOPA | (2) Dopamine |
| (3) Norepinephrine | (4) Epinephrine |
- 02.** Which of the following drug is a tranquilizer ?
- | | |
|-------------|--------------------|
| (1) LSD | (2) Atropine |
| (3) Lithium | (4) Chlorpromazine |
- 03.** Hysterectomy is the removal of ?
- | | |
|------------|------------|
| (1) Kidney | (2) Uterus |
| (3) Ovary | (4) Testis |
- 04.** Which of the following is not essential for normal biosynthesis of thyroid hormone :
- | | |
|-------------------|--------------|
| (1) Iodine | (2) ferritin |
| (3) Thyroglobulin | (4) TSH |
- 05.** Select the best statement for Lymphocytes :
- | |
|---|
| (1) are unaffected by hormones |
| (2) all originate from the bone marrow |
| (3) are part of the body's defense against cancer |
| (4) convert to monocytes in response to antigen |
- 06.** Basic principle involved in the doctor's thermometer (mercury thermometer) is :
- | |
|--|
| (1) Thermal expansion of liquid |
| (2) Thermal expansion of gas above the liquid in the thermometer |
| (3) Capillary action |
| (4) None of the above |

- 07.** The compound which serves as antioxidant in living systems and plays a key role in detoxification is :
- (1) glutathione (2) glutamate
(3) proline (4) tetrahydrofolate
- 08.** Which of the following vitamins regulates Ca^{2+} metabolism ?
- (1) Vitamin A (2) Thiamine
(3) Ascorbic acid (4) Vitamin D
- 09.** An example of antioxidant enzyme is :
- (1) Superoxide dismutase
(2) Choline oxidase
(3) Phenylalanine ammonia lyase
(4) Alcohol dehydrogenase
- 10.** The organ of the body mainly damaged in hepatitis is :
- (1) Heart (2) Liver
(3) Kidney (4) Eye
- 11.** Which one of the following initiates the cardiac pacemaker potential ?
- (1) Ca^{2+} current at L type of channels
(2) K^{+} current
(3) Voltage gated Na^{+} current
(4) Hyperpolarization-activated cyclic nucleotide-gated current

12. In an individual resting O_2 consumption is 1.5L/min and blood O_2 content of arterial and venous is 185 ml/L and 135 ml/L, respectively. Hence his cardiac output is.
- (1) 15.0 L/min (2) 30.0 L/min
(3) 60.0 L/min (4) 12.5 L/min
13. Which one of the following primarily regulates blood volume ?
- (1) Right ventricular chemoreceptors
(2) Arterial baroreceptors
(3) Atrial receptors
(4) central chemoreceptors
14. Young woman suspected of hypothyroidism was having BMR 20 Kcal/ m^2 / hour and her cardiac output was 3.5 L/min. She was having low TSH level and on administration of TRH her TSH level increased considerably. In this case of hypothyroidism may have resulted from.
- (1) Autoimmune destruction of the thyroid tissue.
(2) Malfunctioning of the hypothalamus.
(3) Malfunctioning of the pituitary gland.
(4) Pituitary TSH suppression by hyperactive thyroid nodule.
15. All of the following can occur in adrenocortical insufficiency EXCEPT :
- (1) Failure to excrete water load
(2) Decreased glucose uptake by adipocytes
(3) Increased bone resorption
(4) Increased protein catabolism
16. All of the following increase the ADH secretion EXCEPT :
- (1) In conditions of acute blood loss (around 15-20% of blood volume)
(2) Decreased baroreceptor activity
(3) After consuming a liter of water
(4) Decreased venous return

17. All of the following are correctly paired EXCEPT :
- (1) Stomach- a major site of iron absorption
 - (2) Ileum- a major site for bile absorption
 - (3) Jejunum- an active site of fat absorption & digestion
 - (4) Colon- a major site restricted of H_2O and electrolyte absorption
18. All of the following increase the secretion of gastric pepsin secretion EXCEPT :
- (1) Vagal stimulation
 - (2) Hypoglycemia
 - (3) Histamine
 - (4) Insulin
19. When Plasma glucose concentration equals to renal threshold then the glucose clearance value would be ?
- (1) Equal to inulin clearance
 - (2) 50% of cratinine clearance
 - (3) Very close to 100 ml/min
 - (4) less then 1 ml/min
20. The transport characteristics of the cells of loop of Henle include all of the following EXCEPT :
- (1) Na^+ is actively transported greatly in the thick ascending limb of loop of Henle than the thin ascending limb.
 - (2) Permeability to urea is near zero in the thin ascending limb.
 - (3) Active transport is insignificant in the thin ascending or descending limbs of loop of Henle.
 - (4) Permeability to urea is greater in the thin ascending limb than the thick ascending limb
21. Which one of the following renal vascular bed has greater colloid osmotic pressure ?
- (1) Renal Vein
 - (2) Efferent arterioles
 - (3) Afferent arterioles
 - (4) Renal artery

- 22.** Which one of the following statements is NOT true for withdrawal reflex evoked by cutaneous nerve stimulation ?
- (1) Reciprocal contraction of contralateral extensors
 - (2) Reciprocal inhibition of ipsilateral extensors
 - (3) Involve group II primary afferents
 - (4) Produce after- discharges
- 23.** Which one of the following is true about cerebellar connections ?
- (1) Mossy fibers originate from deep cerebellar nucleus
 - (2) Purkinje cells project on to basket cells
 - (3) Climbing fibers originate from inferior olivary nucleus
 - (4) Granule cells receive climbing fiber input
- 24.** Few weeks following a spinal cord injury (hemisection of the left side at T-12 level) the patient may have all of the following EXCEPT ?
- (1) Loss of touch and pressure sense in the left leg.
 - (2) Exaggerated knee jerk on the left side.
 - (3) Loss of temperature sense in the right leg
 - (4) Loss of pain sensation in the left leg
- 25.** Regarding $\text{Na}^+\text{-K}^+$ ATPase, which one of the following is in the extracellular domain ?
- (1) Na^+ binding site
 - (2) ATP binding site
 - (3) K^+ binding site
 - (4) Phosphorylation site
- 26.** Which of the following is NOT involving the cytosolic receptors to bring the action ?
- | | |
|---------------|-------------------|
| (1) Thyroxine | (2) Retinoic acid |
| (3) Estrogen | (4) Insulin |

27. Which of the following marker substance is used to determine extracellular fluid volume ?
- (1) Heavy water
 - (2) Radioisotopes of Sodium
 - (3) I^{131} labeled albumin
 - (4) Evans blue (T 1824)
28. Which one of the following is NOT true for hemolytic anemia ?
- (1) Reticulocytosis
 - (2) Decreased hematocrit
 - (3) Decreased serum lactic dehydrogenase (LDH) activity
 - (4) Presence of indirect hyperbilirubinemia
29. Each of the following condition is associated with clotting disorders EXCEPT :
- | | |
|-----------------------|------------------------------|
| (1) Christmas disease | (2) Sick cell anemia |
| (3) Hemophilia A | (4) Thrombocytopenic purpura |
30. Which one of the following cells produce antibody during immune response ?
- | | |
|----------------------|-----------------|
| (1) Helper T cell | (2) Plasma cell |
| (3) Cytotoxic T cell | (4) Monocyte |
31. Marked increase in pulmonary interstitial fluid volume activates :
- (1) Lung irritant receptors
 - (2) Juxta-pulmonary capillary receptors
 - (3) Pulmonary inflation receptors
 - (4) Pulmonary deflation receptors

- 32.** The maximum quantity of CO₂ in the blood is transported :
- (1) In dissolved form
 - (2) As carbamino hemoglobin
 - (3) As carboxy hemoglobin.
 - (4) In the form of bicarbonate
- 33.** All of the following are true regarding Hering-Breuer deflation reflex EXCEPT :
- (1) Inactive during normal breathing
 - (2) Inhibits inspiration
 - (3) Mediated by myelinated vagal afferents
 - (4) Associated with mechanical receptors
- 34.** All are true regarding changes in pulmonary circulation during exercise EXCEPT :
- (1) Recruitment of more capillaries
 - (2) Increased blood flow through apex of lung
 - (3) Increase in capillary transit time
 - (4) Increase in pulmonary arterial pressure
- 35.** Hormone that reduces possible immuno rejection of fetus is :
- (1) Progesterone
 - (2) Human placental lactogen
 - (3) Human chorionic gonadotrophin
 - (4) Human chorionic somatotropin
- 36.** Elevated plasma inhibin inhibits :
- (1) LH secretion
 - (2) FSH secretion
 - (3) GnRH secretion
 - (4) Estrogen secretion

- 37.** The function of tropomyosin in skeletal muscle is to :
- (1) Slide actin filaments to produce to shortening
 - (2) Release calcium after initiation of contraction
 - (3) Cover the active sites of actin during relaxation
 - (4) Bind to myosin during contraction
- 38.** All of the following are true for fast (type II) skeletal muscles EXCEPT :
- (1) Contain greater glycolytic enzymes
 - (2) Greater ability of Ca^{2+} pump
 - (3) Larger diameter
 - (4) Higher oxidative capacity
- 39.** All of the following statements regarding endocochlear potential are true EXCEPT :
- (1) It is around 85mV positive to perilymph
 - (2) It is due to high concentration of K^+ in endolymph
 - (3) It is produced in response to sound
 - (4) It is required for the excitability of cochlear hair cells
- 40.** What type of visual loss is seen in a patient with pituitary adenoma ?
- (1) Binasal hemianopia
 - (2) Homonymous hemianopia
 - (3) Multiple scotomas
 - (4) Bitemporal hemianopia

Short Answer Questions

Note: Attempt any **five** questions. Atleast one question from each section **A, B & C**. Write answer in **150-200** words. Each question carries **16** marks. Answer each question on separate page, after writing Question Number.

(A) Draw a diagram of any one (1) of the following

- 01.** Nerve action potential along with ion conductance's producing it.
- 02.** Diagram showing the cerebellar circuitry.

(B) Give physiological explanations for the following : (any 2)

- 03.** Patient with common bile duct obstruction complains of generalized itching sensation.
- 04.** Onset of parturition is delayed in anencephalic baby.
- 05.** Cretinism is associated with mental retardation.
- 06.** Tachycardia is seen in reversible hemorrhagic shock.

(C) Give physiological differences between the following (any 2)

- 07.** Slow wave sleep and fast wave sleep.
- 08.** Obligatory absorption of water and facultative absorption of water.
- 09.** Optic tract lesions and optic radiation lesions.
- 10.** Intrinsic factor and Extrinsic factor.

Question No.

Page for Short Answer

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ROUGH WORK

रफ़ कार्य

ROUGH WORK

रफ़ कार्य

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 प्रश्न छूटा नहीं है। पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण 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।