

2022

PHYSIOLOGY

PAPER-I

Time Allowed — 3 Hours

Full Marks — 200

*If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.*

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

### Group-A

Answer any six questions.

1. (a) Distinguish between Isotonic and Isoosmotic solution.  
(b) What is buffer? Give example.  
(c) Derive Henderson-Hasselbalch equation of buffer system and explain its significance.  
(d) State the importance of alkali reserve in plasma.  $4+(2+2)+(6+2)+4=20$
2. (a) What do you mean by osmotic pressure? State its physiological importance.  
(b) What is osmotic work?  
(c) What do you mean by hypotonic, isotonic and hypertonic solution?  
(d) What will happens if red blood cells (RBC) are placed in pure water?  $(4+4)+2+(2+2+2)+4=20$
3. (a) Define glycolysis and why this name is so appropriate?  
(b) Why glycogen but not glucose is the natural storage form?  
(c) Calculate the total energetics of glycolytic pathway of one molecule of glucose.  
(d) Write the significance of Rapoport-Leubering cycle (R-L cycle).  $(2+2)+4+6+6=20$
4. (a) Describe the general amino acid pool.  
(b) What are glycogenic and ketogenic amino acids? Give example each of them.  
(c) State the differences between hexokinase and glucokinase.  
(d) Distinguish between proteoglycan and glycoprotein.  
(e) What is mutarotation?  $4+(4+2)+(2+2)+(2+2)+2=20$
5. (a) State briefly the role of lipoproteins in lipid transport mechanism.  
(b) What do you mean by 'reverse cholesterol transport'?  
(c) How do phospholipids are different from triglycerides?  
(d) Discuss the triacylglycerol synthesis through glycerophosphate pathway.  $6+4+4+6=20$

# WBCS MADE EASY

CSM(O)/PHLY-I/22

(2)

6. (a) Distinguish between transamination and deamination reaction.  
(b) Describe the role of pyridoxal phosphate in transamination reaction.  
(c) What is glycosidic bond? State its significance in the formation of sugar.  $6+6+(4+4)=20$
7. (a) Explain why disaccharide lactose exhibits reducing property but sucrose does not.  
(b) What are the differences between starch and glycogen?  
(c) Why is glucose also called dextrose?  
(d) What do you mean by epimer and enantiomer?  
(e) "Glucose and galactose are epimers of each other"—explain with reasons.  
(f) What is a 'racemic' mixture?  $4+4+2+4+4+2=20$
8. (a) How many molecule of ATP are required to activate one molecule of fatty acid?  
(b) Why ATP is called as a high energy compound?  
(c) Name the substrate which produce acetyl CoA.  
(d) Name the ketone bodies produced in the body.  
(e) Describe the formation and fate of ketone bodies in human body.  $4+4+2+3+(4+3)=20$
9. (a) Distinguish between nucleoside and nucleotide.  
(b) Write the differences between DNA and RNA.  
(c) What do you mean by good and bad cholesterol and why they are called so?  
(d) What do you mean by fatty liver?  
(e) State the physiological importance of cholesterol in the human body.  $4+4+(2+4)+2+4=20$
10. (a) Why the consumption of raw egg cause biotin deficiency?  
(b) Discuss the function of Vitamin K in blood coagulation.  
(c) Why deficiency of Vitamin C leads to anemia?  
(d) Describe the role of sodium in our body.  
(e) What do you mean by adult consumption unit (ACU)?  $4+4+4+4+4=20$

## Group-B

Answer any four questions.

11. (a) What is immunity?  
(b) Describe the typical structure of immunoglobulin.  
(c) Write the difference between acquired immunity and innate immunity.  
(d) What is plasma cell?  
(e) What are the functions of natural killer cells (NK Cells)?  $2+6+6+2+4=20$

**For guidance of WBCS Prelims , Main Exam and Interview by WBCS Gr A Officers/ Toppers, WBCS Prelims and Main Mock Test (Classroom & Online), Optional Subjects, Study materials, Correspondence Course etc. Call WBCSMadeEasy™ at 8274048710 / 8585843673 or mail us at [mailus@wbcsmadeeasy.in](mailto:mailus@wbcsmadeeasy.in). Download WBCS MADE EASY app from play store. (We offer guidance and mock test for Clerkship, Miscellaneous and other WBPSC Exams. too by WBCS MADE EASY LITE)**

# WBCS MADE EASY

( 3 )

CSM(O)/PHLY-I/22

12. (a) What is called Polycythemia?  
(b) What are the cardiovascular complication that can arise due to Polycythemia?  
(c) What is the significance of biconcave structure of erythrocyte?  
(d) What do you mean by haemophelia?  
(e) Write the chemical structure of haemoglobin. 2+6+4+4+4=20
13. (a) Describe the physiological basis of ABO blood group system.  
(b) Why blood do not clot in the vascular system?  
(c) What is erythroblastosis foetalis?  
(d) Discuss the hazard of blood transfusion. 8+2+4+6=20
14. (a) Describe the structure and functions of intercalated disc.  
(b) Discuss the origin and significance of ECG waves.  
(c) Describe the ionic basis of rhythmicity properties of the heart.  
(d) What do you mean by myocardial infarction? 4+6+6+4=20
15. (a) Describe the role of chloride shift in the transport of CO<sub>2</sub> from tissue to lungs.  
(b) What is Bohr effect?  
(c) Define hypoxia. Classify hypoxia.  
(d) What do you mean by physiological dead space? 6+4+(2+4)+4=20
16. (a) State the differences between cortical and juxta medullary nephron.  
(b) Describe the structural peculiarities of the epithelial cells in human renal tubule.  
(c) Describe the forces involve in glomerular ultrafiltration.  
(d) Discuss the non-excretory functions of kidney. 4+5+5+6=20
- 

**For guidance of WBCS Prelims , Main Exam and Interview by WBCS Gr A Officers/ Toppers, WBCS Prelims and Main Mock Test (Classroom & Online), Optional Subjects, Study materials, Correspondence Course etc. Call WBCSMadeEasy™ at 8274048710 / 8585843673 or mail us at [mailus@wbcsmadeeasy.in](mailto:mailus@wbcsmadeeasy.in). Download WBCS MADE EASY app from play store. (We offer guidance and mock test for Clerkship, Miscellaneous and other WBPSA Exams. too by WBCS MADE EASY LITE)**