No of printed pages/Questions: 05/33

SET-B

O. P. JINDAL SCHOOL, SAVITRI NAGAR

ANNUAL EXAMINATION (2023 – 2024)

Subject: Biology(044) **MM: 70**

Class : XI **Time:3 Hrs.**

General Instructions:

(i)All questions are compulsory.

(ii)The question paper has five sections and 33 questions. All questions are compulsory.

(iii)Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.

(iv)There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

(v)Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION A

Q1.The metabolic rate of most body tissues is controlled by :

(a)ADH (b) TSH (c) ACTH (d) FSH

Q2.Resting membrane potential is maintained by a

(a) Hormone (b) Neurotransmitters (c) Ion pumps (d) All of these

Q3. Accumulation of uric acid crystals in joints causes :

(a) Tetany (b) Arthiritis (c)Gout (d) Muscular dystrophy

Q4. Malphigian body is constituted by

(a) Glomerulus only (b) Glomerulus and Bowman's capsule

(c) Glomerulus and efferent vessel (d) Glomerulus, Bowman's capsule and efferent vessel

Q5.A bivalent of meiosis-I consists of

(a) Two chromatids and one centromere (b)Two chromatids and two centromere

(c) Four chromatids and two centromere (d) Four chromatids and four centromere

Q6. In Calvin cycle, 1 molecule of glucose is formed from

(a) $6CO_2 + 30ATP + 12NADPH$ (b) $6CO_2 + 12ATP$

(c) $6CO_2 + 18ATP + 12NADPH$ (d) $6CO_2 + 18ATP + 30$ NADPH RNA

Q7.Pyruvic acid, the key product of glycolysis can have many metabolic fates.

Under aerobic condition it forms

(a) Lactic acid (b) C02 + H20 (c) Acetyl CoA + C02 (d) Ethanol + CO

Q8. Cortisol is secreted by

(a)Thyroid (b) Pancreas (c) Adrenal (d) Thymus

Q9. Which of the following condition increases the rate of exchange of respiratory gases?

(a)When the respiratory surface is thick (b) Respiratory surface is moist

(c)Concentration gradient is low (d) Pressure of blood flow is low.

Q10. Which of the following develops the greatest pressure on the blood in the mammalian aorta?

(a) systole of the left atrium (b) diastole of the right ventricle

(c)systole of the left ventricle (d)diastole of the right atrium

Q11. Knee joint is

(a) Synovial joint (b) Hyaline joint (c) Fibrous joint (d)Pivot joint

Q12. In the mechanism action of a protein hormone , one of secondary messenger is

(a)Cyclic AMP (b) Insulin (c) T3 (d) T4

Note: From Q.No.13-16 are assertion reason based questions , these options are same for all and select any one option for each.

a. Both assertion and reasonare true,and reason is the correct explanation of assertion.

b. Both assertion and reason are true,but reason is not the correct explanation of assertion.

c. Assertion is true but reason is false.

d. Assertion is false but reason is true .

e. Both assertion and reason are false.

Q13. Assertion :Diplotene is characterized by the presence of chiasmata .

Reason : Diplotene stage can last for months and years in oocytes of some vertebrates .

Q14. Assertion : Cyclic phosphorylation synthesizes ATP .

Reason : ATP synthesise in cyclic phosphorylation is not associated with NADPH formation .

Q15. Assertion : The product of first reaction of Kreb's cycle in citric acid , a six carbon molecule.

Reason : The first reaction of the Kreb's cycle is the condensation of acetylcoA with oxaloacetate.

Q16. Assertion :SARS (Severe Acute Respiratory Syndrome) originated in china .
Reason : China ia most populated country of the world .

SECTION- B

Q17. Mention the significance of Meiosis 2 over Meiosis 1 .

Q18. What are the characteristic features of phylum Annelida ?

Q19. Write the floral formula of Solanaceae family and explain its features also.

Or

Explain Prophase 1 of Meiosis 1 with diagram .

Q20. What is diatomaceous earth ? Diatoms are called as pearl of oceans .Why?

Q21. Draw a well labeled diagram of T.S.of kidney .

Or

Draw a well labeled diagram of human brain .

SECTION –*C*

Q22. Explain diagramatically Z- scheme of light reaction ?

Q23. Explain C4 cycle with one example of C4 plant. Why the name C4 is given ?

Q24. Explain Cardiac cycle .

Or

Draw a well labeled diagram of nephron.

Q25 .Explain Sliding Filament theory .

Q26. What are the characterstics of division Pteridophyta .Give examples .

Or

What are different types of classes of enzymes on the basis of reaction they catalysed ?

Explain any three class .

Q27. Define the following :

(i) Aestivation

(ii) Phyllotaxy

(iii) Placentation

Q28. Draw a well labeled diagram of T.S. of Monocot / Dicot stem .

SECTION -*D*

Q29.Haemoglobin is a red coloured iron containing pigment present in the RBCs. O2 can bind with haemoglobin in a reversible manner to form oxyhaemoglobin. Each haemoglobin molecule can carry a maximum of four molecules of O2. Binding of oxygen with haemoglobin is primarily related to partial pressure of O2. Partial pressure of CO2, hydrogen ion concentration and temperature are the other factors which can interfere with this binding. A sigmoid curve is obtained when percentage saturation of haemoglobin with O2 is plotted against the pO2. This curve is called the Oxygen dissociation curve and is highly useful in studying the effect of factors like pCO2, H+ concentration, etc., on binding of O2 with haemoglobin. In the alveoli, where there is high pO2 , low pCO2 , lesser H+ concentration and lower temperature, the factors are all favourable for the formation of oxyhaemoglobin, whereas in the tissues, where low pO2 , high pCO2 , high H+ concentration and higher temperature exist, the conditions are favourable for dissociation of oxygen from the oxyhaemoglobin. This clearly indicates that O2 gets bound to haemoglobin in the lung surface and gets dissociated at the tissues. Every 100 ml of oxygenated blood can deliver around 5 ml of O2 to the tissues under normal physiological conditions.

1. _____ of O2 and CO2 is carried in a dissolved state through the blood plasma.

(a) 3% and 8% (b) 70% and 20% (c) 3% and 9% (d) 3% and 7%

2. Identify the correct statement / statements

Statement 1 – 7 per cent of O2 is carried in a dissolved state through the plasma

Statement 2 – 3 per cent of CO2 is carried in a dissolved state through plasma.

Statement 3 – 70 per cent of CO2 is carried as bicarbonate.

Statement 4 – 97 per cent of CO2 is transported by RBCs.

(a) Both 1 & 2 are correct

(b) Both 3 & 4 are correct

(c) Only 1 is correct

(d) None of the above

3. Name the factors which play key role in binding of oxygen and haemoglobin.

4. How Oxygen dissociation curve are obtained.

Q30.Pancreas is a composite gland which acts as both exocrine and endocrine gland. The endocrine pancreas consists of 'Islets of Langerhans'. The two main types of cells in the Islet of Langerhans are called α-cells and β-cells. The α-cells secrete a hormone called glucagon, while the β-cells secrete insulin. Glucagon is a peptide hormone, and plays an important role in maintaining the normal blood glucose levels. Glucagon acts mainly on the liver cells (hepatocytes) and stimulates glycogenolysis resulting in an increased blood sugar (hyperglycemia). In addition, this hormone stimulates the process of gluconeogenesis which also contributes to hyperglycemia. Glucagon reduces the cellular glucose uptake and utilisation. Thus, glucagon is a hyperglycemic hormone. Insulin is a peptide hormone, which plays a major role in the regulation of glucose homeostasis. Insulin acts mainly on hepatocytes and adipocytes (cells of adipose tissue), and enhances cellular glucose uptake and utilisation. As a result, there is a rapid movement of glucose from blood to hepatocytes and adipocytes resulting in decreased blood glucose levels (hypoglycemia). Insulin also stimulates conversion of glucose to glycogen (glycogenesis) in the target cells. The glucose homeostasis in blood is thus maintained jointly by the two – insulin and glucagons.

1 _____Hormone produces anti-inflammatory reactions and suppresses the immune response.

(a) cortisol (b) Glucocorticoids (c) Insulin (d) Glucagon

2. ___ Hormone secreted by the α-cells of Islet of Langerhans

(a) Cortisol (b) Glucocorticoids (c) Glucagon (d) Insulin

3. Name the hormone which involves in regulation of glucose homeostasis.

4. What is main difference between hyperglycemia and hypoglycemia?

SECTION –E

Q31. Explain Mitosis in detail with the help of diagram .

Or

Explain Glycolysis .

Q32. What is Photorespiration and why it is a wasteful process ?

Or

Explain Calvin cycle with the help of diagram .

Q33. Explain the Digestive System of frog .

Or

(i) Explain the counter current mechanism

(ii) Describe TCA cycle .

****