1. Glycolysis is also known as
(a) EMP pathway (b) PME pathway
(c) CMT pathway (d) TMC pathway

2. Glycolysis takes place in the cytoplasm of
(a) all living cells (b) eukaryotic cells
(c) anaerobic cells (d) most muscle cells

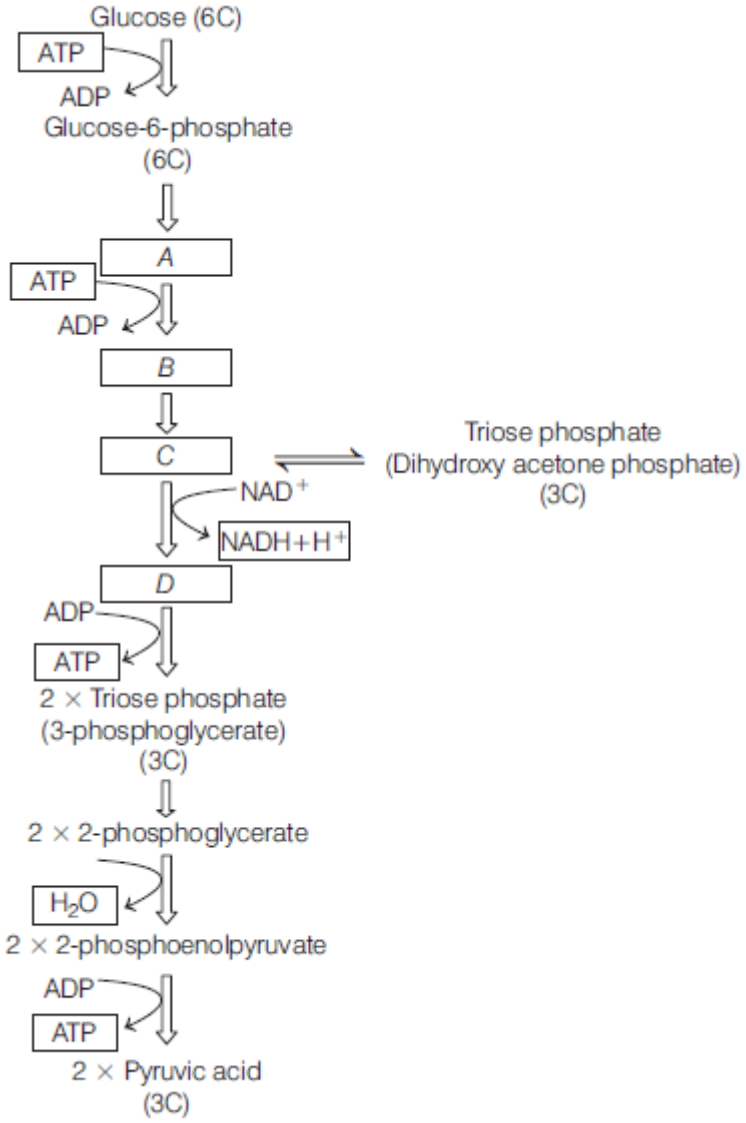
3. In plants, glucose is primarily derived from which of the following?
(a) Protein (b) Fat
(c) Oxalic acid (d) Sucrose

4. In order to enter the glycolytic pathway, sucrose is converted into glucose and fructose by the enzyme
(a) invertase (b) zymase
(c) isomerase (d) triose phosphatase

5. Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalysed by ***NEET 2019***
(a) hexokinase (b) enolase
(c) phosphofructokinase (d) aldolase

6. Glucose- 6-phosphate A ¾¾® Fructose-6- phosphate Identify the enzyme used in the above reaction from the options given below.
(a) Aldolase (b) Phosphofructokinase
(c) Hexokinase (d) Isomerase

7. The flowchart given below shows the steps in glycolysis. Select the option that correctly fills in the missing steps *A*, *B*, *C* and *D*.



(a) A–Fructose-6-phosphate, B–Fructose-1, 6-bisphosphate, C–3 PGAL, D–1, 3-bisphosphoglyceric acid
(b) A–Fructose-1, 6-bisphosphate, B–3 PGAL, C–1, 3-bisphosphoglyceric acid, D–3 PGA
(c) A–3 PGA, B–1, 3-bisphosphoglyceric acid, C–3 PGAL, D–Fructose-1, 6-bisphosphate
(d) A–Fructose-1, 6-bisphosphate, B–Fructose-6-phosphate, C–3 PGAL, D–1, 3-bisphosphoglyceric acid

8. In glycolysis production of pyruvic acid from glucose involves a chain of ten reactions. Each individual reaction needs
(a) one molecule of ATP
(b) one molecule of ADP
(c) one molecule of NAD
(d) one molecule of specific enzyme

9. Which of the following steps during glycolysis is associated with utilisation of ATP ?
(a) Glucose to Glucose-6-phosphate
(b) Fructose-6-phosphate to fructose-1,6-bisphosphate
(c) PEP to pyruvic acid
(d) Both (a) and (b)

10. In which of the following reactions of glycolysis, oxidation takes place?
(a) Glucose-6-PO_4 to fructose-6-PO_4
(b) Glyceraldehyde-3-phosphate to 1, 3-bisphosphoglycerate
(c) 1, 3-diphosphoglycerate to 3-phosphoglycerate
(d) 2-phosphoglycerate to phosphoglycerate

11. In glycolysis, NADH + H+ is formed from NAD, when
(a) 3-phosphoglyceraldehyde (PGAL) is converted to 1, 3- bisphosphoglycerate (BPGA)
(b) triose phosphate is converted to 2-phosphoglycerate
(c) 2-phosphoglycerate is converted to 2- phosphopyruvate
(d) 2-phosphopyruvate is converted to 2-pyruvic acid

12. In which of the following conversions ATP synthesis occurs during glycolysis?
(a) Glucose→ Glucose-6-phosphate
(b) Fructose-6- phosphate→ Fructose-1,6-bisphosphate
(c) 1,3-bisphosphoglyceric acid (BPGA) →3-phosphoglyceric acid (PGA)
(d) All of the above

13. The end product of glycolysis
(a) pyruvic acid (b) acetyl coenzyme
(c) citric acid (d) oxaloacetic acid

14. How many molecules of pyruvic acid are formed in glycolysis? ***JIPMER 2018***
(a) 2 (b) 1
(c) 15 (d) 16

15. Which one is correct sequence in glycolysis?
(a) G-6-P⟶ PEP⟶ 3PGAL⟶ 3PGA
(b) G-6-P⟶ 3PGAL⟶ 3PGA⟶ PEP
(c) G-6-P⟶ PEP⟶ 3 PGA⟶ 3PGAL
(d) G-6-P ⟶ 3 PGA⟶ 3 PGAL⟶ PEP

16. 2NADH (H^+) produced during aerobic glycolysis yield
(a) 6 ATP molecules (b) 4 ATP molecules
(c) 8 ATP molecules (d) None of these

17. Net gain of ATP from one molecule of glucose in glycolysis is
(a) 3 (b) 4
(c) 5 (d) 2

18. The metabolic fate of pyruvic acid formed after glycolysis is
(a) lactic acid fermentation (b) alcoholic fermentation
(c) aerobic respiration (d) All of these

19. Which of the following describes significance of fermentation?
(i) Production of alcohol in brewing industry.
(ii) Making of dough in baking industry.
(iii) Curing of tea and tobacco.
(iv) Production of vinegar by acetic acid bacteria.
(a) (i), (ii) and (iii) (b) (i), (ii) and (iv)
(c) (ii), (iii) and (iv) (d) (i), (ii), (iii) and (iv)

20. Glycolysis occurs in the _____ and produces _____, which in the presence of O_2 enters the _____.
(a) Cytosol; pyruvate; mitochondrion
(b) Cytosol; glucose; mitochondrion
(c) Mitochondrion; pyruvate; chloroplast
(d) Chloroplast; glucose; cytosol

21. Glycolysis is found in
(a) Eukaryotic (b) Anaerobic cells
(c) Virtually all cells (d) Most muscle cells

22. Which one is false for glycolysis?
(a) Substrate level phosphorylation occurs
(b) The end products are CO_2 and H_2O
(c) ATP is formed
(d) ATP is used

23. Fermentation takes palce:
(a) Under anaerobic conditions in many prokaryotes and unicellular eukaryotes
(b) Under aerobic conditions in many prokaryotes and unicellular eukaryotes
(c) Under anaerobic conditions in all prokaryotes and unicellular eukaryotes
(d) Under aerobic conditions in all prokaryotes and unicellular eukaryotes

24. Respiration differs from combustion in which of the following

(a) Energy is released in respiration (b) Substance is oxidised
(c) Enzymes are involved (d) All the above

25. How many ATPs are used in phosphorylation of glucose

(a) One (b) Two(c) Three (d) Four

26. The end product of anaerobic respiration in plants is

(a) Pyruvic acid (b) Malic acid (c) Ethyl alcohol (d) Methyl alcohol

27. The full form of NAD is

(a) Nicotine adenosine diphosphate (b) Nicotinamide adenosine dinucleotide
(c) Nicotinamide adenine dinucleotide (d) Nicotinamide adenine diphosphate

28. Anaerobic process after glycolysis is called

(a) TCA (b) Calvin cycle (c) Krebs cycle (d) Fermentation

29. The high-energy bond of ATP are between

(a) C-C (b) C-O (c) C-N (d) O-P

30. Which of the following is the first step of glycolysis

(a) Breakdown of glucose (b) Phosphorylation of glucose
(c) Conversion of glucose into fructose (d) Dehydrogenation of glucose

1. (*a*) Glycolysis is also called EMP pathway because it was given by three scientists, Gustav Embden, Otto Meyerhof and J Parnas. It is the common pathway to both anaerobic and aerobic metabolism.

2. (*a*) Glycolysis is a series of reactions that take place in the cytoplasm of all prokaryotes and eukaryotes (i.e. all living cells). The role of glycolysis is to produce energy (both directly and by supplying substrate for the citric acid cycle and oxidative phosphorylation) and various intermediate compounds, for biosynthetic pathway.

3. (d)

4. (*a*) Sucrose (a disaccharide) is converted into monosaccharides, i.e. glucose and fructose by the activity of the enzyme invertase. This step initiates the glycolytic pathway.

5. (*a*) Conversion of glucose to glucose-6-phosphate during glycolysis is catalysed by the enzyme hexokinase. During this step, glucose is phosphorylated to glucose-6-phosphate by ATP. It is the first step of activation phase of glycolysis.

6. (d)

7. (a)

8. (*d*) Each reaction in glycolysis is catalysed by its own specific enzyme. Glycolysis is a series of reactions that extract energy from glucose by splitting it into three carbon molecules called pyruvate.

9. (*d*) ATP is utilised in two steps of glycolysis, first in the conversion of glucose into glucose-6-phosphate and second in the conversion of fructose-6- phosphate to fructose-1, 6- bisphosphate.

10. (*b*) In glycolytic pathway, glyceraldehyde-3-phosphate is converted into 1, 3-bisphosphoglyceric acid by an oxidation and phosphorylation reaction, which occurs in the presence of H PO 3 4 and coenzyme NAD.

11. (*a*) Out of all the ten reactions taking place in glycolytic cycle, NADH+ H+ is formed only during conversion of PGAL to BPGA.

12. (*c*) ATP synthesis occurs in two steps of glycolysis

which are

(i) Conversion of BPGA to PGA

(ii) Conversion of phosphoenol pyruvate to pyruvic acid.

13. (b)

14. (a)

15. (b)

16. (*a*) Oxidative phosphorylation or ATP synthesis from NADH occurs only under aerobic condition and this results in the production of 6ATP molecules from 2 NADH.

17. (*d*) In glycolysis, 2 molecules of ATP are consumed initially in converting glucose to fructose-1, 6- bisphosphate. 2 triose phosphate molecules are formed from one glucose molecule. 4 molecules of ATP are produced at substrate level phosphorylation. Therefore, net gain of ATP is $2 \times$ 2ATP − 2ATP = 2

18. (*d*) Pyruvic acid is the key product of glycolysis. Its metabolic fate depends on the cellular need. There are three major ways in which different cells handle pyruvic acid produced by glycolysis. These are lactic acid fermentation, alcoholic fermentation and aerobic respiration.

19. (d)

20. (a)

21. (c)

22. (b)

23. (a)

24. (c)
25. (b)
26. (c)
27. (c)
28. (d)
29. (d)
30. (b)