1. **There are 3 enzymes involved in the pyruvate dehydrogenase system; each one is having 3 different prosthetic group attached to them.**

Match the boxes-

Enzyme	Prosthetic group
1. Pyruvate dehydrogenase	a. FAD
2. Dihydrolipoyl transacetylase	b. TPP
3. Dihydrolipyl dehydrogenase	c. α-Lipoic acid

(i) 1-a, 2-c, 3-b
(ii) 1-b, 2-c, 3-a
(iii) 1-c, 2-a, 3-b
(iv) 1-b, 2-a, 3-c

2. **An amino acid residue at the active site of dihydrolipoyl transacetylase enzyme and involve in the attachment with its prosthetic group-**

(i) Ser (ii) Thr
(iii) Asn (iv) Lys

3. **The reactive part of thiamine pyrophosphate is-**

(i) phosphate
(ii) thiazolium ring
(iii) amine
(iv) All of the above

4. **Which of the following options is correct -**

(i) Transketolase is a TPP-dependent enzyme
(ii) 2nd carbon of thiazolium ring of TPP binds to α-carbon of pyruvate
(iii) In the last step of TPP-dependent reactions an acetaldehyde is transferred
(iv) All of the above

5. ***Effective yield of high-energy bonds in the PDH complex pathway-***

(i) 2.5 (ii) 4
(iii) 2 (iv) 5

6. **Dichloroacetate (DCA) can be useful as a metabolic therapy for cancer. It is a**

(i) PDH kinase activator
(ii) PDH kinase inhibitor
(iii) PDH phoshorylase activator
(iv) PDH phosphorylase inhibitor

7. **cAMP to 5'-AMP is catalyzed by-**

(i) Adenylyl cyclase
(ii) Phophodiesterase
(iii) Phosphorylase
(iv) Phophatase

8. **Which is false regarding Tarui's disease-**

(i) It's a glycogen storage disease type V
(ii) Effected enzyme is phosphofructokinase I
(iii) Patient may also suffers from hemolytic anemia
(iv) Muscle glycogen reaches an abnormally higher value

9. **One type of glycogen storage disease occurs due to deficiency of acid alpha-glucosidase, that is-**

(i) McArdle disease
(ii) Pompe's disease
(iii) von Gierke's disease
(iv) Tarui's disease

10. **Choose the wrong option-**

(i) Limit dextrinosis, GSD type III is due to deficiency of glycogen debranching enzyme
(ii) Limit dextrinosis, GSD type III is due to deficiency of glycogen branching enzyme
(iii) Anderson disease, GSD type IV is due to deficiency of glycogen branching enzyme
(iv) All are false

11. **McArdle disease or GSD type V is due to deficiency of-**

(i) Glycogen synthase
(ii) Muscle glycogen phosphorylase
(iii) Glucose-6-phosphatase
(iv) Muscle lactate dehydrogenase

12. **Which is true about von Gierke's disease-**

(i) It is due to deficiency of Glycogen synthase
(ii) Hyperglycemia is one characteristic feature
(iii) Hyperlipemia is one characteristic feature
(iv) Hepatomegaly is not a characteristic feature

13. **Aldolase is a glycolytic enzyme, which has 3 isozymes- A,B and C. Which one is true regarding it-**

(i) Aldolase A is present in brain
(ii) Aldolase B is catalyzes the reverse reaction as compared to Aldolase C

(iii) Aldolase C possess lower affinity for fructose-1,6-bisphosphate as compared to Aldolase B
(iv) Aldolase C is present is muscle

14. What is special about glycolysis in RBC-

(i) Here the first site of ATP formation in traditional glycolysis may be shunted
(ii) Extra enzymes are needed for this shunt
(iii) There is no ATP production occurs in this shunt
(iv) All of the above

15. Which enzyme is needed for the formation of 2, 3-BPG in RBC-

(i) BPG mutase
(ii) Phosphoglycerate kinase
(iii) BPG phosphatase
(iv) All of the above

16. Reactive amino acid present at the active site of phosphoglycero mutase-

(i) Lysine
(ii) Histidine
(iii) Serine
(iv) Alanine

17. Hexokinase has four isozymes- I, II, III, IV. Each has different properties. Arrange them in decreasing order of substrate affinity-

(i) I, II, III, IV
(ii) I, III, II, IV
(iii) IV, I, II, III
(iv) III, I, II, IV

18. Glucokinase is one type of hexokinase. It is hexokinase type-

(i) I
(ii) II
(iii) III
(iv) IV

19. Four isozymes of hexokinase are localized at different places of body. Glucokinase is localized in-

(i) Brain
(ii) Kidney
(iii) Muscle
(iv) Liver

20. Which hexokinase is specific for glucose only-

(i) I
(ii) II
(iii) III
(iv) IV

21. One heavy metal poisoning in human body inhibits PDH enzyme-

(i) Lead
(ii) Arsenic
(iii) Aluminium
(iv) Silver

22. Isoalloxazine ring is present in-

(i) TPP
(ii) NAD^+
(iii) FAD
(iv) Histidine

23. Rossman fold is present in the enzyme-

(i) Hexokinase
(ii) Phosphohexose isomerase
(iii) Aldolase
(iv) LDH

24. Importance of phosphorylated intermediates in metabolic pathways like glycolysis-

(i) No transporter is there for them to prevent them from leaving the cell
(ii) Energy is partially conserved in their formation
(iii) Binding of phosphate groups increases their specificity of reactions
(iv) All are correct

25. What is true about Warburg effect?

(i) Cancer cells show high rate of glycolysis
(ii) Inhibition of fermentation in the presence of oxygen
(iii) Under high rate of glycolysis, respiration inhibition occurs
(iv) All of the above

26. What is true about Pasteur effect?

(i) Cancer cells show high rate of glycolysis
(ii) Inhibition of fermentation in the presence of oxygen
(iii) Under high rate of glycolysis, respiration inhibition occurs
(iv) All of the above

27. What is true about Crabtree effect?

(i) Cancer cells show high rate of glycolysis
(ii) Inhibition of fermentation in the presence of oxygen
(iii) Under high rate of glycolysis, respiration inhibition occurs
(iv) All of the above

28. Based on the Warburg effect, a drug Imatinib was approved, it is a-

(i) Hexokinase inhibitor
(ii) Glucose uptake inhibitor
(iii) Hexokinase synthesis inhibitor
(iv) Transketolase synthesis inhibitor

29. Based on the Warburg effect, a drug Lonidamine was approved, it is a

(i) Hexokinase inhibitor
(ii) Glucose uptake inhibitor
(iii) Hexokinase synthesis inhibitor
(iv) Transketolase inhibitor

30. Which glucose transporter is insulin dependent?

(i) GLUT2
(ii) GLUT3
(iii) GLUT4
(iv) GLUT5

31. Which glucose transporter is located in liver?

(i) GLUT2
(ii) GLUT3
(iii) GLUT4
(iv) GLUT5

32. Which glucose transporter islocated in brain?

(i) GLUT2
(ii) GLUT3
(iii) GLUT4
(iv) GLUT5

33. GLUT4 is located in-

(i) brain
(ii) liver
(iii) kidney
(iv) muscle

34. Which glucose transporter has highest K_t for glucose?-

(i) GLUT2
(ii) GLUT3
(iii) GLUT4
(iv) GLUT5

35. 35. Which glucose transporter is specific for fructose?

(i) GLUT2
(ii) GLUT3
(iii) GLUT4
(iv) GLUT5

36. Which glucose transporter regulate insulin release?

(i) GLUT2
(ii) GLUT3
(iii) GLUT4
(iv) GLUT5

37. Match the 3 enzymes of glycolysis and their respective enzymes of gluconeogenesis from pyruvate, where they catalyse the same reactions but in different directions-

Glycolysis	Gluconeogenesis
A. Hexokinase	1. Malate dehydrogenase
B. Pyruvate kinase	2. PEPCK
C. Fructose-1,6-bisphosphatase	3. Pyruvate carboxylase
	4. PFK-1
	5. Glucose-6-phosphatase

(i) A-3,4; B-5,2; C-1
(ii) A-5; B-3,2,1; C-4
(iii) A-3,2; B-1,4; C-5
(iv) A-5; B-3,2; C-4,1

38. Glucose-6-phosphatase resides in-

(i) lumen of SER
(ii) mitochondria
(iii) cytosol
(iv) plasma membrane

39. Some plants contain a poison fluoracetate, and consumption of those plants can cause death. It is also used as pesticides. Fluoracetate acts by inhibiting one important enzyme, that is-

(i) Pyruvatecarboxylase
(ii) Citrate synthase
(iii) Glucose-6-phosphatase
(iv) Aconitate hydratase

40. Malonate acts as a competitive inhibitor of a TCA cycle enzyme-

(i) Malatedehydrogenase
(ii) Succinatethiokinase
(iii) Succinatedehydrogenase
(iv) Aconitase

41. Isocitrate dehydrogenase is the 3rd enzyme of TCA cycle, which catalyzes the dehydrogentation and decarboxylation of isocitrate and converts it to α-ketoglutarate. This enzyme has 3 isozymes in human. Which options are correct here?-

(a) One uses NAD^+ as cofactor.
(b) Another two uses $NADP^+$
(c) All 3 reside in mitochondria
(d) There are 5 genes for coding these 3 enzymes

(i) a,b,c
(ii) b,c,d
(iii) a,b,d
(iv) a,c,d

42. One TCA cycle enzyme that is inner mitochondrial membrane bound-

(i) Citrate synthase
(ii) Succinatethiokinase
(iii) Succinatedehydrogenase
(iv) Malatedehydrogenase

43. Succinate thiokinase-

(i) also called succinyl-CoA synthetase
(ii) requires ADP or GDP
(iii) requires Ca^{2+}
(iv) both (i) and (ii) are correct.

44. Match the boxes-

TCA cycle molecules	Required vitamin
1. Citrate synthase	a. thiamin
2. Aconitase	b. niacin
3. Isocitrate dehydrogenase	c. riboflavin
4. α-Ketoglutarate dehydrogenase	d. pantothenic acid
5. Succinate thiokinase	

6. Succinate dehydrogenase	
7. Fumarase	
8. Malate dehydrogenase	
9. Acetyl-CoA	
10. Succinyl-CoA	

(i) a-2,3; b-6,7; c-5; d-1,9,10
(ii) a-4; b-3,4,6,8; c-6; d-9,10
(iii) a-4; b-4,6; c-3
(iv) a-2,3; b-4,8; c-5,6; d-1,10

45. Which food has highest glycemic index?

(i) Riper fruits
(ii) Processed foods
(iii) Over-cooked foods
(iv) All

46. Main energy provider during slow twitch muscle activity-

(i) Ketone bodies (ii) Glycogen
(iii) Amino acids (iv) Glucose

47. Main pathway for fast twitch muscle activity-

(i) Gluconeogenesis
(ii) Pentose phosphatepathway
(iii) Lipogenesis
(iv) Glycolysis

48. Activity of this enzyme increases during fasting condition

(i) Pyruvate kinase
(ii) Glucokinase
(iii) Glycogen synthase
(iv) PEPCK

49. Glucagon acts as activator of this enzyme-

(i) Pyruvate kinase
(ii) Glucokinase
(iii) Glycogen synthase
(iv) PEPCK

50. Which one is true?

(i) Pyruvate dehydrogenase is activated by NADH
(ii) ADP acts as inhibitor of pyruvate kinase
(iii) Insulin is activator of pyruvate kinase
(iv) Glucagon is repressor of glucose 6-phosphatase

51. ADP acts as an inhibitor of-

(i) pyruvate carboxylase
(ii) pyruvate kinase
(iii) pyruvate dehydrogenase
(iv) phosphofructokinase-I

52. Which enzyme of gluconeogenesis from propionate is vit-B12 dependent?-

(i) Methylmalonyl-CoAracemase
(ii) Methylmalonyl-CoA mutase
(iii) Acyl-CoAsynthetase
(iv) Propionyl-CoA carboxylase

53. The product from propionate during gluconeogenesis which enters the TCA cycle-

(i) Succinyl-CoA
(ii) Oxaloacetate
(iii) Acetyl-CoA
(iv) Citrate

54. Which is false about the pathway of gluconeogenesis from propionate?-

(i) There is one vit-B6 dependent enzyme
(ii) There is one vit-B7 dependent enzyme
(iii) There is one Mg^{2+} dependent enzyme
(iv) 2 ATPs are consumed in this pathway

55. Ruminants, birds and human have different amount of normal blood glucose. Ruminants has relatively lower levelthan others, because-

(i) they consume less carbohydrate diet
(ii) they have higher level of insulin
(iii) they convert carbohydrate to amino acids instead of glucose
(iv) they convert carbohydrate to fatty acids instead of glucose

56. Carboxylase enzymes like pyruvate carboxylase require biotin for its activity. Which amino acid residue reside at the catalytic site of these enzymes?-

(i) Lys
(ii) His
(iii) Ser
(iv) Asn

57. Calcium is one of the regulator of TCA cycle. The enzymes which are regulated by it-

(i) Aconitase
(ii) Fumarase
(iii) Succinatethiokinase
(iv) Isocitratedehydrogenase

58. Glycerol-3-phosphate shuttle is used by –

(i) heart
(ii) kidney
(iii) brain
(iv) liver

59. In glycerol-3-phosphate shuttle, the reducing equivalents are transferred from NADH to-

(i) Complex I
(ii) Complex II
(iii) Complex III
(iv) Complex IV

60. In malate-aspartate shuttle, the reducing equivalents are transferred from NADH to-

(i) Complex I
(ii) Complex II
(iii) Complex III
(iv) Complex IV

61. Number of ATP formed from complete aerobic oxidation of glucose, when glycerol-3-phosphate shuttle is used- (2.5 ATP per NADH, 1.5 ATP per $FADH_2$)-

(i) 30 (ii) 32
(iii) 34 (iv) 35

62. Number of ATP formedfrom complete aerobic oxidation of glucose, when malate-aspartate shuttle is used- (2.5 ATP per NADH, 1.5 ATP per $FADH_2$)-

(i) 30 (ii) 32
(iii) 34 (iv) 35

63. What are true about glycogenin?

(a) It's acts as a glucose primer
(b) It's a protein
(c) Addition of glucose on it is catalysed by glycogen synthase
(d) Addition of glucose on it is catalysed by its own enzymatic activity
(e) Glucose is transferred on its Lys residue
(f) It has transglycosylase activity

(i) a,b,c,e
(ii) c,d,f
(iii) a,b,d
(iv) b,c,f

64. What is the speciality about glycogen synthase?-

(a) It has autocatalytic action
(b) It's inactive form is phosphorylated
(c) It can be phosphorylated by 11 different kinases

(i) a and b
(ii) b and c
(iii) a, b and c
(iv) a and c

65. The most important glycogen synthase kinase is-

(i) GSK1 (ii) GSK2
(iii) GSK3 (iv) GSK4

66. Priming of glycogen synthase is obtained by the action of-

(i) Caesin kinase
(ii) Glycogen synthase kinase
(iii) Glycogen phophorylase
(iv) Glycogenin

67. Which of the following statements about the control of muscle glycogen phosphorylase is correct?

(i) It is allosterically activated by cAMP.
(ii) It is allosterically activated by ATP.
(iii) It normally exists in the a form.
(iv) It is activated by phosphorylation by an active phosphorylase kinase.

68. It uses glucose as its only energy source-

(i) Cardiac muscle (ii) RBC
(iii) Brain (iv) Skeletal muscle

69. Glucose is utilized poorly in-

(i) Cardiac muscle
(ii) RBC
(iii) Brain
(iv) Skeletal muscle

70. Glycolysis in RBC results in the formation of-

(i) Pyruvate
(ii) Lactate
(iii) Both
(iv) Acetyl-CoA

71. What is true about the reaction catalysed by α-Ketoglutarate dehydrogenase complex?-

(i) ATP is consumed
(ii) ATP is formed
(iii) Carboxylation occurs here
(iv) Irreversible reaction

72. Muscle glycogen plays a role in-

(i) Blood glucose maintenance in post-prandial condition
(ii) Blood glucose maintenance in starvation condition
(iii) Both
(iv) Muscle mass maintenance

73. The correct option is-

(i) Liver glycogen weighs about 5% of liver
(ii) Muscle glycogen weighs about 15% of small
(iii) Liver contains highest body glycogen
(iv) All are correct

74. Muscle could not provide glucose immediately, because-

(i) there is no glucose-6-phosphatse enzyme
(ii) there is no phosphorylase enzyme
(iii) there is less GLUT
(iv) they are less vascularized

75. Neoglucogeneis occurs mainly at-

(i) Kidney
(ii) Muscle
(iii) Heart
(iv) Brain

76. The major pathways of RBC-

(a) Aerobic glycolysis
(b) Anaerobic glycolysis
(c) Neoglucogeneis
(d) Beta-Oxidation
(e) TCA cycle
(f) HMP shunt

(i) a,e
(ii) a,c,d
(iii) b,f
(iv) d,e

77. The major pathways of heart-

(a) Aerobic glycolysis
(b) Anaerobic glycolysis

(e) Neoglucogeneis
(d) Beta-Oxidation
(e) TCA cycle
(f) HMP shunt

(i) a,e
(ii) a,c,d
(iii) b,f
(iv) d,e

78. In glycolysis, the first carbon of pyruvatecomes from-

(i) 1st carbon of glucose
(ii) 6th carbon of glucose
(iii) Both i and ii are correct
(iv) 3rd carbon of glucose

79. The 1st carbon of acetyl-CoA comes from-

(i) 1st carbon of glucose
(ii) 2nd carbon of glucose
(iii) 3rd carbon of glucose
(iv) 4th carbon of glucose

80. Which intermediate of glycolysis is directly linked to biosynthesis of lysophosphatidate?-

(i) glucose-6-phosphate
(ii) 3-PGA
(iii) enol pyruvate
(iv) DHAP

81. The 4th carbon of α-ketoglutarate comes from-

(i) 1st carbon of glucose
(ii) 2nd carbon of glucose
(iii) 3rd carbon of glucose
(iv) 4th carbon of glucose

82. Commercial citrate production requires $FeCl_2$ in medium. Which is true about it?-

(i) Cl^- dependent enzyme is there
(ii) $FeCl_2$ is needed in high amount
(iii) $FeCl_2$ amount does not matter
(iv) $FeCl_2$ is needed in low amount

83. Which of the following option regarding glycogenolysis and glycogenesis regulation is false?

(i) Activation of cAMP dependent protein kinase inhibits glycogen synthesis in muscle.
(ii) Active glycogen synthase (a) is dephosphorylated
(iii) Protein phosphatase-1 is activated by glucagon
(iv) Inhibitor-1-phosphate is activated by cAMP dependent protein kinase

84. Calcium/calmodulin dependent enzyme of glycogenolysis and glycogenesis regulation pathways is-

(i) Glycogen synthase
(ii) Protein phophatase-1
(iii) Phosphodiesterase
(iv) cAMP dependent protein kinase

85. Which is true about β blocker drugs –

(i) Stimulate glycogenolysis
(ii) causes hyperglycemia
(iii) good for diabetic condition
(iv) All are false

86. Correct pair which decreases blood glucose level-

(i) Insulin, epinephrine
(ii) Insulin, β blocker
(iii) Glucagon, , β blocker
(iv) Both i and iii

87. Which are true about protein phosphatse-1-

(a) Activated by cAMP dependent protein kinase inhibitors
(b) It inactivates phosphorylase kinase
(c) It activates phophorylase
(d) It inactivates glycogen synthase

(i) a,b,d
(ii) b,c,d
(iii) a,b,c
(iv) a,c,d

88. If phosphodiesterase activity is stimulated, then-

(i) more cAMP will accumulate
(ii) inhibitor-1-phosphate will be formed more
(iii) glycogenesis will occur
(iv) All of the above will happen

89. It is shown that fructose is cleared from blood at a normal rate in diabetic patients, why?-

(i) they consume low fructose-diet
(ii) fructose has keto group which helps in its elimination
(iii) fructose metabolism is not affected by insulin
(iv) All are correct

90. The enzyme that specifically converts fructose to fructose-6-phophate-

(i) Hexokinase
(ii) Glucokinase
(iii) Ketokinase
(iv) Fructokinase

91. The enzyme that specifically converts fructose to fructose-1-phophate in liver-

(i) Hexokinase
(ii) Glucokinase
(iii) Ketokinase
(iv) Fructokinase

92. Enzyme which reversibly converts fructose to sorbitol-

(i) Aldosereductase
(ii) Sorbitoldehydrogenase
(iii) Both
(iv) not given

93. After ingestion of milk, galactose is converted to glucose by some enzymes, sequentially order them –

(a) Glycogen synthase
(b) Galactokinase
(c) Galactose-1-phosphate uridyl transferase
(d) Phosphoglucomutase
(e) Phosphorylase
(f) Glucose-6-phosphatse
(g) Uridine diphosphogalactose 4-epimerase

(i) b,d,f,g,c,e,a
(ii) b,c,g,a,e,d,f
(iii) b,c,g,a,f,d,e
(iv) f,g,a,c,b,e,d

94. Which HMP shunt pathway enzymes are dependent on Ca^{2+} ?-

(a) Ribose-5-phosphateketoisomerase
(b) 6-Phosphogluconatedehydrogenase
(c) Gluconolactonehydrolase
(d) Transketolase
(e) Transaldolase
(f) Glucose-6-phosphatedehydrogenase

(i) b, c
(ii) b,f
(iii) d,e
(iv) c,f

95. There is only one decarboxylation step in pentose phosphate pathway. That step is catalysed by-

(i) Glucose-6-phosphatedehydrogenase
(ii) 6-Phosphogluconatedehydrogenase
(iii) PRPPsynthetase
(iv) 6-Phosphogluconate decarboxylase

96. What is true about glutathione peroxidase?-

(i) Helps in removal of hydrogen peroxide from RBC and increases its life span
(ii) Contains selenocysteine, 21st amiono acid, in its active site
(iii) Works in coordination with glutathione reductase
(iv) All of the above

97. Mark the false statements –

(a) Transaldolase is thiamine dpendent
(b) Transketolase is thiamine dependent
(c) Transketolase transfers 3 carbon group from ketose to aldose sugar
(d) Transladolase transfers 2 carbon group from ketose to aldose sugar
(e) sedoheptulose-7-phosphate is formed by the action of transaldolase

(i) a,c,d
(ii) b,c,d,e
(iii) c,d,e
(iv) a,b,c,d,e

98. In pentose phosphate pathway, ribulose-5-phosphate is converted to ribose -5-phosphate and xylulose-5-phosphate, respectively by the actions of-

(i) ketoisomerase and 3-epimerase
(ii) ketoisomerase and 2-epimerase
(iii) 3-epimerase and ketoisomerase
(iv) 2-epimerase and ketoisomerase

99. What is false about glycogenesis and glycogenolysis?.

(i) High cAMP level stimulates glycogen phophorylase
(ii) Glycogenin is a 37-kDa protein
(iii) Glycogen synathse form glycoside bond between C-4 of the glucose of UDPG and C-1 of terminal glucose
(iv) Glycogen phosphorylase requires coenzyme PLP

100. Insulin and glucagon are the major hormones that regulate glucose homeostasis and produced by cells of the pancreatic islets. Mark the false statements about them-

(a) Insulin receptor is a dimer and it is a member of receptor tyrosine kinases
(b) Phosphatidyl inositol is required for insulin action on glycogen synthase
(c) Insulin activates GSK-3
(d) Insulin activates protein phosphatase-1 (PP1)
(e) Glucagon works via G-protein, increasing cAMP
(f) Insulin work via protein kinase A (PKA) and glucagon works via protein kinase B (PKB)
(g) Insulin works after consuming meal
(h) Glucagon works between meals/ extended fasting
(i) PKB act on phosphorylase kinase

(i) b,d,g
(ii) c,f,i
(iii) d,e,i
(iv) b,g,h

Answers

1. ii	11. ii	21. ii	31.i	41. iii	51. i	61. i	71. iv	81. i	91. iv
2. iv	12. ii	22. iii	32. ii	42. iii	52. ii	62. ii	72. ii	82. iv	92. ii
3. ii	13. ii	23. iv	33. iv	43. iv	53. i	63. iii	73. i	83. iii	93. ii
4. iv	14. iii	24. iv	34. i	44. ii	54. i	64. ii	74. i	84. iv	94. iv
5. i	15. i	25. i	35. iv	45. iv	55. iv	65. iii	75. i	85. iv	95. ii
6. ii	16. ii	26. ii	36. i	46. i	56. i	66. i	76. ii	86. ii	96. iv
7. ii	17. iii	27. iii	37. ii	47. iv	57. iv	67. iv	77. iv	87. iii	97. i
8. i	18. iv	28. iii	38. i	48. iv	58. iii	68. ii	78. iv	88. iii	98. i
9.ii	19. iv	29. i	39. iv	49. iv	59. iii	69. i	79. ii	89. iii	99. iii
10.i	20.iv	30.iii	40.iii	50. iii	60. i	70. ii	80. ii	90. i	100. ii