

पुस्तिका में पृष्ठों की संख्या : 24  
Number of Pages in Booklet : 24

प्रश्न-पत्र पुस्तिका संख्या /  
Question Paper Booklet No.

5200397

पुस्तिका में प्रश्नों की संख्या : 180  
No. of Questions in Booklet : 180

**BSAPBc-02**

**Paper Code : 02**

**SUBJECT : Biochemistry**

परीक्षा दिनांक :- 11/08/2020

समय : 3.00 घण्टे  
Time : 3.00 Hours

परीक्षा समय :- 9:00 To 12:00

अधिकतम अंक : 180  
Maximum Marks : 180

प्रश्न-पत्र पुस्तिका एवं उत्तर पत्रक के पेपर सील/पॉलिथीन बैग को खोलने के बाद परीक्षार्थी प्रश्न-पत्र पुस्तिका संख्या को उत्तर पत्रक पर सावधानीपूर्वक अंकित करें। इसमें किसी भी प्रकार की त्रुटि होने पर जिम्मेदारी अभ्यर्थी की होगी।

The candidate fill the Question Paper Booklet No. on Answer Sheet carefully after opening the Paper Seal / Polythene bag. Candidate himself shall be responsible for any error.

**परीक्षार्थियों के लिए निर्देश**

1. सभी प्रश्नों के उत्तर दीजिए।
2. सभी प्रश्नों के अंक समान हैं।
3. प्रत्येक प्रश्न का केवल एक ही उत्तर दीजिए।
4. एक से अधिक उत्तर देने की दशा में प्रश्न के उत्तर को गलत माना जाएगा।
5. प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं, जिन्हें क्रमशः 1, 2, 3, 4 अंकित किया गया है। अभ्यर्थी को सही उत्तर निर्दिष्ट करते हुए उनमें से केवल एक गोले अथवा बबल को उत्तर पत्रक पर नीले बॉल प्वाइंट पेन से गहरा करना है।
6. OMR उत्तर पत्रक इस परीक्षा पुस्तिका के अन्दर रखा है। जब आपको परीक्षा पुस्तिका खोलने को कहा जाए, तो उत्तर-पत्र निकाल कर ध्यान से केवल नीले बॉल प्वाइंट पेन से विवरण भरें।
7. प्रत्येक गलत उत्तर के लिए प्रश्न अंक का 1/3 भाग काटा जायेगा। गलत उत्तर से तात्पर्य अशुद्ध उत्तर अथवा किसी भी प्रश्न के एक से अधिक उत्तर से है। किसी भी प्रश्न से संबंधित गोले या बबल को खाली छोड़ना गलत उत्तर नहीं माना जायेगा।
8. मोबाइल फोन अथवा इलेक्ट्रॉनिक यंत्र का परीक्षा हॉल में प्रयोग पूर्णतया वर्जित है। यदि किसी अभ्यर्थी के पास ऐसी कोई वर्जित सामग्री मिलती है तो उसके विरुद्ध आयोग द्वारा नियमानुसार कार्यवाही की जायेगी।
9. कृपया अपना रोल नम्बर ओ.एम.आर. पत्रक पर सावधानीपूर्वक सही भरें। गलत अथवा अपूर्ण रोल नम्बर भरने पर 5 अंक कुल प्राप्तांकों में से काटे जा सकते हैं।

**चेतावनी:** अगर कोई अभ्यर्थी नकल करते पकड़ा जाता है या उसके पास से कोई अनधिकृत सामग्री पाई जाती है, तो उस अभ्यर्थी के विरुद्ध पुलिस में प्राथमिकी दर्ज कराते हुए विविध नियमों-प्रावधानों के तहत कार्यवाही की जाएगी। साथ ही विभाग ऐसे अभ्यर्थी को भविष्य में होने वाली विभाग की समस्त परीक्षाओं से विवर्जित कर सकता है।

**INSTRUCTIONS FOR CANDIDATES**

1. Answer all questions.
2. All questions carry equal marks.
3. Only one answer is to be given for each question.
4. If more than one answers are marked, it would be treated as wrong answer.
5. Each question has four alternative responses marked serially as 1, 2, 3, 4. You have to darken only one circle or bubble indicating the correct answer on the Answer Sheet using BLUE BALL POINT PEN.
6. The OMR Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars carefully with blue ball point pen only.
7. 1/3 part of the mark(s) of each question will be deducted for each wrong answer. A wrong answer means an incorrect answer or more than one answers for any question. Leaving all the relevant circles or bubbles of any question blank will not be considered as wrong answer.
8. Mobile Phone or any other electronic gadget in the examination hall is strictly prohibited. A candidate found with any of such objectionable material with him/her will be strictly dealt as per rules.
9. Please correctly fill your Roll Number in O.M.R. Sheet. 5 Marks can be deducted for filling wrong or incomplete Roll Number.

**Warning :** If a candidate is found copying or if any unauthorized material is found in his/her possession, F.I.R. would be lodged against him/her in the Police Station and he/she would liable to be prosecuted. Department may also debar him/her permanently from all future examinations.

इस परीक्षा पुस्तिका को तब तक न खोलें जब तक कहा न जाए।  
Do not open this Test Booklet until you are asked to do so.

02-□



1. Which of the following is an inhibitor of ADP-ATP translocase ?
  - (1) Atractyloside
  - (2) Oligomycin
  - (3) Antimycin-A
  - (4) Cyanide
  
2. Which of the following catalyse the direct transfer and incorporation of oxygen into a substrate molecule ?
  - (1) Oxygenases
  - (2) Hydroperoxidases
  - (3) Oxidases
  - (4) Dehydrogenases
  
3. Complexes acting as proton pumps are
  - (1) Complex I, II and III
  - (2) Complex II, III and IV
  - (3) Complex I, II and IV
  - (4) Complex I, III and IV
  
4. What is the number of catalytic sites in a single polypeptide chain of a debranching enzyme ?
  - (1) 2
  - (2) 3
  - (3) 4
  - (4) 6
  
5. The rate limiting step in glycogenolysis is catalysed by the enzyme
  - (1) glucose 6-phosphatase
  - (2) glycogen phosphorylase
  - (3) glycogen synthase
  - (4) phosphoglucomutase
  
6. Which of the following is not a constituent of glycoproteins ?
  - (1) D-mannose
  - (2) D-xylose
  - (3) D-Galactose
  - (4) D-Ribulose
  
7. O-glycosidic linkage found in collagen is
  - (1) GalNAc-Ser
  - (2) Gal-Hydroxylysine
  - (3) Gal-Gal-Xyl-Ser
  - (4) Gluc Nac-Ser
  
8. Which of the following is not found in human glycoproteins ?
  - (1) Mannose
  - (2) Xylose
  - (3) Fucose
  - (4) Sucrose



9. Activity of pentose phosphate pathway is low in
- (1) adrenal cortex
  - (2) skeletal muscle
  - (3) erythrocytes
  - (4) adipose tissue
10. Neuraminic acid is a nine carbon sugar derived from
- (1) mannosamine and pyruvate
  - (2) galactosamine and pyruvate
  - (3) galactosamine and lactate
  - (4) mannosamine and lactate
11. Storage polysaccharide in animals is
- (1) glycogen
  - (2) starch
  - (3) inulin
  - (4) chitin
12. Leigh's disease is caused by deficiency of the enzyme
- (1) pyruvate carboxylase
  - (2) glucose 6-phosphatase
  - (3) phosphoenol pyruvate carboxykinase
  - (4) fructose-6-phosphate
13. The  $\alpha$ -ketoglutarate dehydrogenase complex is inhibited by
- (1) NADH and succinyl Co-A
  - (2) calcium
  - (3) dephosphorylation
  - (4) phoshorylation
14. The glycolytic enzymes functioning as a glucose sensor in blood glucose homeostasis is
- (1) Hexokinase
  - (2) Glucokinase
  - (3) Pyruvate kinase
  - (4) Aldolase
15. Biochemical finding not reported in a patient presenting with diabetic ketoacidosis is
- (1) glycosuria
  - (2) initial hyperkalemia
  - (3) high plasma bicarbonate
  - (4) ketonuria
16. In Tangier disease
- (1) there is a defect in the synthesis of apo B.
  - (2) there is partial deficiency of apo B.
  - (3) plasma HDL concentrations are reduced.
  - (4) VLDL and LDL are absent from plasma.

17. Lipoprotein particles lowest in density and largest in size are
- (1) LDL
  - (2) VLDL
  - (3) chylomicrons
  - (4) HDL
18. Dipalmitoyl lecithin/sphingomyelin ratio (L/S ratio) in amniotic fluid indicating fetal lung maturity is
- (1)  $\geq 2$
  - (2)  $\geq 0.2$
  - (3)  $< 1$
  - (4)  $< 0.2$
19. Principal sterol in the feces is
- (1) Cholesterol
  - (2) Lanosterol
  - (3) Desmosterol
  - (4) Coprostanol
20. The main source of NADPH for lipogenesis is
- (1) Glycogenolysis
  - (2) Gluconeogenesis
  - (3) Glycolysis
  - (4) Pentose Phosphate Pathway
21. Patients with retinitis pigmentosa have low blood levels of
- (1) linoleic acid
  - (2) linolenic acid
  - (3) arachidonic acid
  - (4) docosahexanoic acid
22. Phospholipase A<sub>2</sub> catalyses the hydrolysis of glycerophospholipids to form
- (1) glycerophosphocholine
  - (2) free fatty acid and lysophospholipid
  - (3) cholesteryl ester and lysolecithin
  - (4) dihydrosphingosine
23. Which of the following is not a feature of sphingolipidosis ?
- (1) Cause neurodegeneration.
  - (2) Rate of synthesis of stored lipid is normal.
  - (3) Enzymatic defect is in lysosomal degradation pathway.
  - (4) Extent of decreased activity of affected enzyme varies in all tissues.
24. The enzyme deficient in Krabbe's disease is
- (1) Sphingomyelinase
  - (2)  $\beta$ -galactosidase
  - (3)  $\beta$ -glucosidase
  - (4) ceramidase

25. Which of the following hormone inhibits lipolysis ?
- (1) Insulin
  - (2) Growth hormone
  - (3) Catecholamines
  - (4) Thyroid Stimulating Hormone
26. Source of all carbon atoms in cholesterol is
- (1) Malonyl Co-A
  - (2) Succinyl Co-A
  - (3) Acetyl Co-A
  - (4) Methyl Co-A
27. Which of the following is not synthesised from arachidonic acid via the lipoxygenase pathway ?
- (1)  $LTA_4$
  - (2)  $LTB_4$
  - (3)  $LTC_3$
  - (4)  $LTC_4$
28. Liver glutamate dehydrogenase activity is activated by
- (1) ADP
  - (2) ATP
  - (3) GTP
  - (4) NADH
29. Second nitrogen of urea is provided by reaction catalysed by the enzyme
- (1) argininosuccinate lyase
  - (2) ornithine transcarbamoylase
  - (3) argininosuccinate synthase
  - (4) arginase
30. Which of the following amino acids does not participate in transamination ?
- (1) Proline
  - (2) Ornithine
  - (3) Glutamine
  - (4) Asparagine
31. The glycine cleavage system consists of
- (1) 5 enzymes and an "H-protein"
  - (2) 3 enzymes and an "H-protein"
  - (3) 1 enzyme and an "H-protein"
  - (4) only H-protein
32. Type IV and V phenylketonuria arise from defect in
- (1) phenylalanine hydroxylase
  - (2) dihydrobiopterin biosynthesis
  - (3) dihydrobiopterin reductase
  - (4) tyrosine aminotransferase

33. Tryptophan oxygenase is feedback inhibited by
- (1) Tryptophan
  - (2) Nicotinic acid derivatives
  - (3) Adrenal corticosteroids
  - (4) Pyridoxal phosphate
34. 5-Hydroxytryptophan on decarboxylation forms
- (1) 5-methoxytryptamine
  - (2) N-acetylserotonin
  - (3) 5-hydroxytryptamine
  - (4) Melatonin
35. Histidine is degraded to
- (1) Oxaloacetate
  - (2) Acetyl Co-A
  - (3) Succinyl Co-A
  - (4)  $\alpha$ -ketoglutarate
36. An example of a co-enzyme B<sub>12</sub>-associated enzyme in mammals is
- (1) methionine synthase
  - (2) phenylalanine hydroxylase
  - (3) glutaminase
  - (4)  $\alpha$ -ketoisovalerate dehydrogenase
37. Which of the following is used in food industry for production of cheese ?
- (1) Collagenase
  - (2) Elastase
  - (3) Renin
  - (4) Pepsin
38. Activity of hepatic bilirubin UDP-glucuronyl transferase reaches adult levels in about
- (1) 2 weeks
  - (2) 4 weeks
  - (3) 6 weeks
  - (4) 8 weeks
39. Rate of heme synthesis is relatively constant in
- (1) Liver
  - (2) Erythroid tissue
  - (3) Kidney
  - (4) Mature RBC
40. The enzyme of heme synthesis inhibited by lead is
- (1) ALA synthase
  - (2) ALA dehydratase
  - (3) Hydroxymethyl bilane synthase
  - (4) Uroporphyrinogen I synthase



41. Defect in conversion of uroporphyrinogen to coproporphyrinogen is due to deficiency of the enzyme
- (1) uroporphyrinogen I synthase
  - (2) uroporphyrinogen decarboxylase
  - (3) uroporphyrinogen III synthase
  - (4) coproporphyrinogen oxidase
42. Specific inhibitor of dihydro-orotate dehydrogenase used for the treatment of rheumatoid arthritis is
- (1) Fluorouracil
  - (2) Leflunomide
  - (3) Aminopterin
  - (4) Methotrexate
43. In pseudouridine, ribose is linked to
- (1) C<sub>5</sub> of uridine
  - (2) C<sub>4</sub> of uridine
  - (3) N<sub>1</sub> of uridine
  - (4) N<sub>3</sub> of uridine
44. The overall determinant of the rate of denovo purine nucleotide biosynthesis is
- (1) rate of PRPP synthesis
  - (2) activity of PRPP synthase
  - (3) the concentration of PRPP
  - (4) availability of ribose 5-phosphate
45. Conversion of inosine monophosphate to adenylosuccinate requires
- (1) GTP
  - (2) ATP
  - (3) AMP
  - (4) GMP
46. Deficiency of which urea cycle enzyme results in the excretion of pyrimidine precursors ?
- (1) Arginase
  - (2) Ornithine transcarbamoylase
  - (3) Argininosuccinate synthase
  - (4) Argininosuccinate lyase
47. Which of the following is a poor source of iron ?
- (1) Milk
  - (2) Jaggery
  - (3) Liver
  - (4) Leafy vegetables
48. Mineral required for RNA polymerase activity is
- (1) Iron
  - (2) Manganese
  - (3) Selenium
  - (4) Molybdenum

49. Which of the following indices represents the ratio between the amount of nitrogen retained and nitrogen absorbed during a specific interval ?
- (1) Net protein utilisation
  - (2) protein efficiency ratio
  - (3) biological value of protein
  - (4) chemical score of protein
50. Specific dynamic action for carbohydrates is
- (1) 5%
  - (2) 15%
  - (3) 20%
  - (4) 30%
51. Biochemical findings associated with plasma iron overload are
- (1) increased iron, decreased transferrin, increased ferritin
  - (2) decreased iron, increased transferrin, decreased ferritin
  - (3) decreased iron, normal transferrin, normal ferritin
  - (4) increased iron, normal transferrin, normal ferritin
52. Which of the following is a cause of hypokalemia ?
- (1) Acute kidney injury
  - (2) Parenteral infusion
  - (3) Addison's disease
  - (4) Diarrhoea
53. An example of intra-venous fluid used for hypotonic fluid replacement is
- (1) Ringer's solution
  - (2) Dextrose - saline
  - (3) 0.9% sodium chloride
  - (4) Hartman's solution
54. Use of aluminium containing antacids causes deficiency of the mineral
- (1) Calcium
  - (2) Phosphorous
  - (3) Magnesium
  - (4) Iron
55. The initial excited form of rhodopsin is
- (1) iodopsin
  - (2) bathorhodopsin
  - (3) metarhodopsin
  - (4) lumirhodopsin
56. Which of the following vitamin can be synthesised from amino acid tryptophan ?
- (1) Pyridoxine
  - (2) Thiamin
  - (3) Biotin
  - (4) Niacin



57. The binding protein secreted in saliva and required for B<sub>12</sub> absorption is
- (1) Intrinsic factor
  - (2) Cobalophilin
  - (3) Albumin
  - (4) Globulin
58. Compound synthesised by intestinal bacteria and having biological activity of vitamin K is
- (1) Phylloquinone
  - (2) Menaquinone
  - (3) Menadione
  - (4) Menadiol diacetate
59. Which of the following hormone is derived from an amino acid ?
- (1) Antidiuretic hormone
  - (2) Cortisol
  - (3) Prostaglandins
  - (4) Estradiol
60. In the icteric stage of acute hepatitis, urinary urobilinogen is
- (1) Normal
  - (2) Increased
  - (3) Absent
  - (4) Decreased
61. Overactivity of thyroid gland is seen in
- (1) Grave's disease
  - (2) Myxoedema
  - (3) Hashimoto's thyroiditis
  - (4) Iodine deficiency
62. Plasma cortisol concentrations are at their highest level
- (1) during the day
  - (2) in night
  - (3) late evening
  - (4) shortly after waking
63. Increased serum thyroid stimulating hormone levels are seen in
- (1) Hashimoto's thyroiditis
  - (2) autonomous thyroid hormone secretion
  - (3) Euthyroid sick syndrome
  - (4) toxic multinodular goiter
64. Decreased serum Leutinizing Hormone levels are seen in
- (1) polycystic ovary syndrome
  - (2) pituitary hypothalamic impairment
  - (3) primary gonadal dysfunction
  - (4) post menopausal women



65. The inactive G protein is a
- (1) monomer with  $\alpha$  sub-unit
  - (2) dimer with  $\alpha$ ,  $\beta$  sub-units
  - (3) trimer with  $\alpha$ ,  $\beta$  and  $\gamma$  sub-units
  - (4) tetramer with  $2\alpha$ ,  $1\beta$  and  $1\gamma$  sub-units
66. Decreased levels of serum aldosterone are seen in
- (1) Conn's syndrome
  - (2) Addison's disease
  - (3) Bilateral adrenal hyperplasia
  - (4) Cardiac failure
67. A single turn of B-DNA about the long axis of molecule contains
- (1) 5 bp
  - (2) 8 bp
  - (3) 10 bp
  - (4) 12 bp
68. Poly A tail of mRNAs
- (1) prevents nucleolytic attack by 5'-exonucleases
  - (2) maintains intracellular stability of specific mRNAs
  - (3) recognises mRNA by translation machinery
  - (4) serves as adapter for translation
69. The 60s sub-unit of eukaryotic rRNA comprises of
- (1) 5s rRNA, 5.8s rRNA
  - (2) 16s rRNA, 28s rRNA
  - (3) 5s rRNA, 5.8s rRNA, 28s rRNA
  - (4) 5s rRNA, 5.8s rRNA, 16s rRNA
70. RNA representing as potential agents for therapeutic drug development are
- (1) tRNAs
  - (2) siRNAs
  - (3) lncRNAs
  - (4) sRNAs
71. Eukaryotic DNA polymerase responsible for mitochondrial DNA synthesis is
- (1)  $\alpha$
  - (2)  $\beta$
  - (3)  $\gamma$
  - (4)  $\epsilon$
72. The mobile complex between helicase and primase is known as
- (1) nucleosone
  - (2) primosome
  - (3) ribosome
  - (4) histone

73. During the S-phase, nuclear DNA is replicated

- (1) half
- (2) once
- (3) twice
- (4) many times

74. tRNA-binding site(s) in ribosomes is/are

- (1) A site
- (2) E site
- (3) A site, P site
- (4) A site, P site and E site

75. Tissue-specific protein isoforms can be made from same pre-mRNA through

- (1) alternative polyadenylation
- (2) mRNA editing
- (3) alternative splicing
- (4) mRNA translation

76. Constitutive gene in *lac operon* is

- (1) lac Z
- (2) lac Y
- (3) lac A
- (4) lac I

77. Non-homologous end joining occurs in which phase of the cell cycle ?

- (1) G<sub>0</sub> phase
- (2) G<sub>1</sub> phase
- (3) Mitotic phase
- (4) S phase

78. Defect in correction of chemical induced DNA cross-links causes

- (1) Xeroderma pigmentosum
- (2) Cockayne syndrome
- (3) Fanconi's anaemia
- (4) Fragile X-syndrome

79. RNA polymerases are metalloenzymes containing

- (1) Magnesium
- (2) Manganese
- (3) Copper
- (4) Zinc

80. Exceptionally large testicles are seen in patients with

- (1) Fragile X-syndrome
- (2) Xeroderma pigmentosum
- (3) Hereditary non-polypsis colorectal cancer
- (4) Fanconi's anaemia



81. Six-base-pair sequence located 10 nucleotides upstream of the transcription start site in prokaryotes is
- (1) Pribnow box
  - (2) -35 region
  - (3) Hogness box
  - (4) CAAT box
82. The enzyme that degrades the RNA portion of a DNA-RNA hybrid is
- (1) terminal transferase
  - (2) DNAase I
  - (3) reverse transcriptase
  - (4) RNAase H
83. All of the following are epigenetic factors controlling gene expression, except :
- (1) spatial cell-cell and cell-matrix contact
  - (2) chromatin remodelling
  - (3) chromosomal recombination
  - (4) methylation/demethylation
84. The three nucleotide sequence is referred to as
- (1) intron
  - (2) codon
  - (3) exon
  - (4) anticodon
85. Which of the following is NOT a characteristic feature of genetic code ?
- (1) Universal
  - (2) Non-overlapping
  - (3) Degenerate
  - (4) Ambiguous
86. The disadvantage of plasmids as DNA cloning vector is that they are
- (1) self replicating
  - (2) composed of gene sequences transcribable into mRNA
  - (3) found in bacteria and yeast
  - (4) unstable in eukaryotic cells
87. Protein causing correct termination of transcription process is
- (1) sigma
  - (2) TATA-box-binding protein
  - (3) rho protein
  - (4) ribonucleoprotein
88. An inactive segment of DNA arising by the mutation of a parental active gene is termed as
- (1) cDNA
  - (2) SNPs
  - (3) pseudogene
  - (4) tandem

89. The method to map the location of specific proteins bound to discrete DNA sequences within living cells is
- (1) global run on sequencing
  - (2) native elongating transcript sequencing
  - (3) microarray hybridisation
  - (4) chromatin immunoprecipitation
90. Exonuclease III is used in recombinant DNA research for
- (1) homopolymer tailing
  - (2) DNA sequencing
  - (3) RNA mapping studies
  - (4) genome editing
91. Which of the following is important for proper recognition of a given tRNA by its aminoacyl tRNA synthetase ?
- (1) The D loop and arm
  - (2) The T $\psi$ C loop and arm
  - (3) Anticodon arm
  - (4) The variable loop
92. Homologous pairing of the sister chromatids is mediated by
- (1) Rad 51 protein
  - (2) BRCA<sub>2</sub>
  - (3) Ku protein
  - (4) WRN protein
93. Genes expressed at a more or less constant level on almost all the cells of an organism are known as
- (1) inducible genes
  - (2) proto-oncogenes
  - (3) repressible genes
  - (4) house-keeping genes
94. Stop codons of mRNA are
- (1) UAA UGA UGG
  - (2) UAA UAG UGA
  - (3) UAA UAG
  - (4) UAA UGA
95. Antibiotic inhibiting protein synthesis in both eukaryotes and prokaryotes is
- (1) Puromycin
  - (2) Ricin
  - (3) Cycloheximide
  - (4) Chloramphenicol
96. The precise initiation codon in translation is determined by
- (1) Kozak consensus sequences
  - (2) TATA box
  - (3) Pribnow box
  - (4) 5' UTR sequences

97. The human genome project was completed in the year
- (1) 1990
  - (2) 2000
  - (3) 2003
  - (4) 2010
98. Base pairing as per Chargaff's rule is
- (1) A with T ; G with C
  - (2) A with G ; G with C
  - (3) A with C ; G with T
  - (4) A with G ; A with T
99. Percentage of human DNA containing genes is
- (1) 1-2%
  - (2) 10-20%
  - (3) 50-70%
  - (4) 85-90%
100. An antibiotic inhibiting peptidyl transferase activity in eukaryotic translation is
- (1) Ricin
  - (2) Tetracycline
  - (3) Erythromycin
  - (4) Cycloheximide
101. Defect in DNA mismatch repair mechanism causes
- (1) Ataxia telangiectasia
  - (2) Cockayne syndrome
  - (3) Fragile X-syndrome
  - (4) Hereditary non-polyposis colorectal cancer
102. The supercoiling of DNA is controlled by
- (1) Topoisomerases
  - (2) Gyases
  - (3) DNA polymerase I
  - (4) Helicases
103. Human topoisomerase functioning via a controlled mechanism is
- (1) Type IA topoisomerase
  - (2) Type IB topoisomerase
  - (3) Type IC topoisomerase
  - (4) Type II topoisomerase
104. Transposons are
- (1) mobile segments of DNA
  - (2) operons for ribosomal proteins
  - (3) members of nuclear receptor superfamily
  - (4) hormone response elements
105. Which of the following is an inhibitor of type IB topoisomerases ?
- (1) Novobiocin
  - (2) Ciprofloxacin
  - (3) Camptothecin
  - (4) Doxorubicin
106. In autosomal recessive inheritance
- (1) abnormal genes affect both heterozygotes and homogygote.
  - (2) only affect homogygous offspring.
  - (3) clinically normal offspring are not carriers of abnormal gene.
  - (4) offspring in successive generations are affected.

107. The enzyme that polymerises ribonucleotides into an RNA sequence complementary to the template strand of a gene is
- (1) Reverse transcriptase
  - (2) DNA dependent RNA polymerase
  - (3) RNA dependent RNA polymerase
  - (4) RNA dependent replicase
108. The enzyme forming peptide bond during protein synthesis is
- (1) protein kinase
  - (2) peptidyl transferase
  - (3) GTPase
  - (4) peptidase
109. The approximate number of base pairs associated with a single nucleosome are
- (1) 50-60
  - (2) 145-150
  - (3) 450-455
  - (4) 800-820
110. ADP ribosylation of histones is associated with
- (1) DNA repair
  - (2) activation of gene transcription
  - (3) gene activation
  - (4) transcription repression
111. The technique used for confirmatory diagnosis of COVID-19 disease is
- (1) PCR
  - (2) RTPCR
  - (3) ELISA
  - (4) SARS-CoV-2 antibody tests
112. Familial Goiter can be treated by
- (1) replacing missing product
  - (2) introducing enzyme into somatic cells
  - (3) replacing mutant enzyme
  - (4) replacing diseased organ by normal organ
113. The unit that measures genetic linkage is
- (1) VNTRs
  - (2) SNPs
  - (3) Lod score
  - (4) Morgan
114. The method used to identify and isolate genes involved in disease by establishing the highest resolution map is
- (1) polymerase chain reaction
  - (2) DNA sequencing
  - (3) conventional cloning
  - (4) *in situ* hybridisation

115. Which of the following is an early clinical finding, suggestive of an inborn error of metabolism ?
- (1) Hypoglycemia
  - (2) Renal calculi
  - (3) Short stature
  - (4) Refractory rickets
116. Management of alkaptonuria includes
- (1) low glycine diet
  - (2) use of  $\beta$ -adrenergic blocking agents
  - (3) long term administration of ascorbic acid
  - (4) avoidance of leucine, isoleucine or valine
117. A high plasma ALP activity with raised GGT concentration suggests
- (1) viral hepatitis
  - (2) cholestasis
  - (3) cirrhosis
  - (4) fatty liver
118. Clinical disorder associated with hypersecretion of aldosterone is
- (1) Cushing syndrome
  - (2) Conn's syndrome
  - (3) Addison's disease
  - (4) Adreno-cortical carcinoma
119. Which of the following is a cause of decreased plasma urea to creatinine ratio ?
- (1) High protein intake
  - (2) Dehydration
  - (3) Gastro-intestinal bleeding
  - (4) Dialysis
120. Which of the following is a test for fat absorption ?
- (1) Xylose absorption test
  - (2) Triolein breath test
  - (3) FIGLU test
  - (4) Stool antigen test
121. Which of the following is an indirect marker of hepatic fibrosis ?
- (1) serum hyaluronic acid
  - (2) procollagen type carboxy terminal peptide
  - (3) alpha-2 mcroglobulin
  - (4) transforming growth factor Beta-I
122. Hyperacidity is seen in
- (1) gastritis
  - (2) gastric carcinoma
  - (3) pernicious anaemia
  - (4) duodenal ulcer
123. In pancreatic fibrocystic disease
- (1) only sodium is increased in sweat.
  - (2) both sodium and chloride are decreased in sweat.
  - (3) both sodium and chloride are increased in sweat.
  - (4) only chloride is decreased in sweat.



124. Which of the following test is based on synthetic function of liver ?

- (1) Prothrombin time
- (2) Serum total bilirubin
- (3) Alkaline phosphatase
- (4) Urine bile pigments

125. Decreased serum and urine osmolality is seen in

- (1) hypercalcemia
- (2) hyponatremia
- (3) dehydration
- (4) congestive heart failure

126. Which of the following test is useful in distinguishing patients with pancreatic steatorrhoea from those with abnormal fat absorption ?

- (1) Pancreolauryl test
- (2) Schilling's test
- (3) Bentriomide test
- (4) Secretin/cck stimulation test

127. Decreased ability to concentrate is caused by high level of which air pollutant ?

- (1) Ozone
- (2) Carbon monoxide
- (3) Air borne lead
- (4) Sulfur dioxide

128. Radioactive isotope used for the treatment of polycythemia is

- (1)  $^{14}\text{C}$
- (2)  $^{32}\text{P}$
- (3)  $^{125}\text{I}$
- (4)  $^{99}\text{Tc}$

129. The proteins present in colostrum are predominantly

- (1) Lactoglobulins
- (2) Lactalbumins
- (3) Immunoglobulins
- (4) Caesin

130. Which of the following is excreted as glucuronides in phase-2 reactions of xenobiotic metabolism ?

- (1) Benzoic acid
- (2) Isoniazid
- (3) Arylamines
- (4) Phenols

131. Light meromyosin (LMM)

- (1) consists of soluble  $\alpha$ -helical fibres.
- (2) does not exhibit ATPase activity.
- (3) binds to F-actin.
- (4) has molecular mass about 340 kDa.

132. Which of the following cannot replenish stores of ATP in the muscle ?

- (1) Lipolysis
- (2) Oxidative phosphorylation
- (3) Creatine phosphate
- (4) 2 molecules of ADP

133. The epidermolysis bullosa mutations in COL7A1 affects structure of

- (1) type I collagen
- (2) type III collagen
- (3) type V collagen
- (4) type VII collagen

134. Which of the following is a structural component of microfibrils ?

- (1) Fibronectin
- (2) Fibrillin
- (3) Laminin
- (4) Elastin

135. Which of the following is not a characteristic of collagen ?

- (1) Triple helix
- (2) No carbohydrate
- (3) Presence of hydroxyl lysin
- (4) Many different genetic types

136. Which of the following is NOT a characteristic of cytochrome p450s ?

- (1) Are hemoproteins
- (2) Present in liver in lowest amounts
- (3) Many are inducible
- (4) Extremely versatile catalysts

137. Presence of calcium pyrophosphate dehydrate (CPPD) crystals in synovial fluid is characteristic of

- (1) pseudogout
- (2) acute gouty arthritis
- (3) chronic gout
- (4) Rickets

138. Which of the following is NOT a reason for turbidity in spinal fluid ?

- (1) Presence of large numbers of bacteria
- (2) Presence of bacteria
- (3) Presence of lipids
- (4) Traumatic tap

139. Accumulation of fragments of serum amyloid A (SAA) results in

- (1) Alzheimer's disease
- (2) Primary amyloidosis
- (3) Secondary amyloidosis
- (4) Familial amyloidosis

140. The immunoglobulin found in milk and tears is
- (1) IgG
  - (2) IgA
  - (3) IgM
  - (4) IgD
141. Primary immunodeficiency disorder with T cell deficiency is
- (1) Di George's syndrome
  - (2) AIDS
  - (3) Selective IgA deficiency
  - (4) Bruton's agammaglobulinemia
142. Which of the following theories of aging hypothesises that the changes associated with old age and death itself reflect the accumulation of damage over time ?
- (1) Pacemaker theory
  - (2) Wear and tear theory
  - (3) Free radical reaction theory
  - (4) Mutation theory
143. Which of the following is a biomarker of aging ?
- (1) Adiponectin
  - (2) Lipofuscin
  - (3) Ghrelin
  - (4) Transerthylin
144. Tumour marker for trophoblastic disease is
- (1) Calcitonin
  - (2) Alpha-fetoprotein
  - (3) Human chorionic gonadotropin
  - (4) Monoclonal immunoglobulin
145. Changes of gene expression without any change of the sequence of bases in DNA refers to
- (1) genome instability
  - (2) epigenetic changes
  - (3) copy number variations
  - (4) chromosomal instability
146. A normal cellular gene which when mutated gives rise to a product contributing to development of cancer is
- (1) oncogene
  - (2) proto-oncogene
  - (3) oncosuppressor gene
  - (4) house-keeping gene
147. Number of HIV particles in the blood can be estimated by
- (1) RTPCR
  - (2) ELISA
  - (3) Western Blot analysis
  - (4) PCR
148. Which type of oxygen radical damage initiates autoimmune disease ?
- (1) Radical damage to DNA in germline cells
  - (2) chemical modification of proteins in plasma
  - (3) chemical modification of amino acids in proteins
  - (4) radical damage to DNA in somatic cells

149. The most effective naturally occurring chain breaking antioxidant in tissues is

- (1) Vitamin E
- (2) Vitamin C
- (3) B-carotene
- (4) Vitamin A

150. ABG data of a patient is 7.50 pH ; 46 mmHg  $pCO_2$  ; 35 mmol/L  $HCO_3^-$ . Interpret the stage of compensation.

- (1) Fully compensated metabolic alkalosis
- (2) Fully compensated metabolic acidosis
- (3) Partially compensated metabolic alkalosis
- (4) Uncompensated respiratory alkalosis

151. The classical form of renal tubular acidosis (type I RTA) presents with

- (1) hyperchloremic acidosis
- (2) hyperkalaemia
- (3) high urinary  $NH_4^+$  excretion
- (4) Glycosuria

152. Which of the following is a cause of respiratory acidosis ?

- (1) Chronic obstructive pulmonary disease
- (2) Hepatic failure
- (3) Pregnancy
- (4) Gram negative septicaemia

153. Which of the following is a cause of decreased anion gap ?

- (1) Lactic acidosis
- (2) Ketoacidosis
- (3) Drug or toxin induced
- (4) Lithium intoxication

154. Which of the following systematically catalogues genetic variations based on large scale SNP analysis ?

- (1) The international HapMap project
- (2) The Human Genome project
- (3) The Cancer genome project
- (4) The Human protein atlas

155. The program of BLAST which compares a protein query sequence against a nucleotide sequence database is


- (1) blastp
- (2) blastn
- (3) blastx
- (4) tblastn

156. Evidence based laboratory medicine (EBLM) cycle includes how many areas of activity related to the clinical problem ?

- (1) 2
- (2) 3
- (3) 4
- (4) 5



157. Volumetric flasks are used to
- (1) transfer liquids
  - (2) measure volume of liquids
  - (3) hold different volumes of liquids
  - (4) hold exact volume of liquid
158. What volume is needed to make 1000 ml of a 0.1 M solution of tris buffer from a solution of 2 M tris buffer ?
- (1) 25 ml of 2 M solution
  - (2) 50 ml of 2 M solution
  - (3) 75 ml of 2 M solution
  - (4) 100 ml of 2 M solution
159. Which of the following is NOT an approved method for treatment and dispersion of medical waste ?
- (1) Incineration
  - (2) Steam sterilisation
  - (3) Burial
  - (4) Thermal activation
160. The level of laboratory water recommended for preparing buffers is
- (1) Type I Reagent water
  - (2) Type II Reagent water
  - (3) Type III Reagent water
  - (4) Both Type I and Type III Reagent water

161. Hazard communication standard pictogram of exclamation mark  is indicative of
- (1) oxidizers
  - (2) gases under pressure
  - (3) carcinogen
  - (4) Irritants (skin and eye)
162. Which of the following is an example of an active error in laboratory ?
- (1) Chronic shortage of staff
  - (2) Failing of identify a patient before phlebotomy
  - (3) Lack of interface with technology
  - (4) Poor lab layout
163. Proficiency Testing (PT)
- (1) provides a guide to functioning of equipment
  - (2) confirms the accuracy of testing
  - (3) detects errors resulting from adverse environmental conditions
  - (4) is a means to maintain quality control between laboratories
164. The instrument used to show the quantitative relationship between the colours of unknown solution and the standard solution is
- (1) Electrolyte analyser
  - (2) Spectrophotometer
  - (3) Flow cytometer
  - (4) Flame photometer

165. Free heme formed during the breakdown of haemoglobin binds to hemopix in a
- (1) 2:1 ratio
  - (2) 1:0.5 ratio
  - (3) 1:1 ratio
  - (4) 1:2 ratio
166. In dehydration, there is
- (1) an increase in total protein, albumin and globulin
  - (2) decrease in total protein, albumin and globulin
  - (3) decrease in total protein, globulin and normal levels of albumin
  - (4) an increase in total protein, globulin and normal levels of albumin
167. The major LDH isoenzyme fraction found in the sera of healthy individuals is
- (1) LD-1
  - (2) LD-2
  - (3) LD-3
  - (4) LD-4
168. Formation of peptides from amino acids is accompanied by a net
- (1) loss of one positive and one negative charge per peptide bond
  - (2) gain of one positive and one negative charge per peptide bond
  - (3) loss of one positive charge per peptide bond
  - (4) gain of one negative charge per peptide bond
169. A catalytically active enzyme – co-factor complex is known as
- (1) Holoenzyme
  - (2) Co-enzyme
  - (3) Apoenzyme
  - (4) Prosthetic group
170. Low plasma alkaline phosphatase activity is caused by
- (1) Rickets and osteomalacia
  - (2) Ulcerative colitis
  - (3) Paget's disease
  - (4) Anchondroplasia
171. Methemoglobin is
- (1) haemoglobin in which iron is in ferric form
  - (2) formed when oxygen is incorporated in hemoglobin
  - (3) formed when heme combines with plasma albumin
  - (4) formed when carbon monoxide binds to hemoglobin
172. An amino acid derivative used clinically to relieve pain is
- (1) Azaserine
  - (2) Cycloserine
  - (3) Gabapentin
  - (4) Histamine

173. Which of the following is a conjugated protein ?

- (1) Lectins
- (2) Flavoprotein
- (3) Scleroprotein
- (4) Albumin

174. Which of the following enzymes is a ligase ?

- (1) Fumarase
- (2) Pyruvate carboxylase
- (3) Hexokinase
- (4) Phosphoglucomutase

175. The enzyme activated during well fed state is

- (1) glycogen synthase
- (2) glucose 6-phosphatase
- (3) pyruvate carboxylase
- (4) fructose 1, 6, bisphosphatase

176. Which of the following cannot be utilised by the brain as a source of fuel ?

- (1) Ketone bodies
- (2) Fatty acids
- (3) Glucose
- (4) Acetoacetate

177. As a metabolic adaptation, gluconeogenesis is accelerated in which stage of starvation ?

- (1) First stage
- (2) Second stage
- (3) Third stage
- (4) Fourth stage

178. Resting heart's fuel of choice is

- (1) glycogen
- (2) fatty acids
- (3) glucose
- (4) ketone bodies

179. In the adipose tissue, decrease in insulin and increase in glucagon results in

- (1) activation of lipogenesis
- (2) activation of intracellular hormone sensitive lipase
- (3) activation of lipoprotein lipase
- (4) inhibition of release of glycerol from adipose tissue

180. An insecticide which inhibits complex I (NADH-Q oxidoreductase) is

- (1) Amytal
- (2) Rotenone
- (3) Antimycin A
- (4) Cyanide

रफ कार्य के लिए स्थान / SPACE FOR ROUGH WORK

