rothers.com, for detailed information on PGMEE books, visit our website www.jaypeebrothers.com, for detailed information on PGMEE book

diginerve
A Jaypee Initiative
Your Guide at Every Step
Video Lectures | Notes | Self-Assessment
Scan to Know More

Self-Assessment & Review of

FMGE/MCI

Screening Examination

SUPPLEMENT

Updated till December 2021

Exclusive Features

Image-based MCQs, Problem-based MCQs with explanation, All subjects MCQs and Quick review points

Kamal KV

4th Edition

JAYPEE

CONTENTS

Image Based MCQs 1-36

Image-based Questions *3*

Problem Based MCQs with Explanation.....37-132

1. **Anatomy** *39*
2. **Physiology** *43*
3. **Biochemistry** *47*
4. **Pathology** *51*
5. **Pharmacology** *57*
6. **Microbiology** *61*
7. **Forensic Medicine** *66*
8. **Preventive and Social Medicine** *69*
9. **Ear, Nose and Throat** *78*
10. **Ophthalmology** *82*
11. **Medicine** *86*
12. **Surgery** *98*
13. **Obstetrics** *108*
14. **Gynecology** *113*
15. **Dermatology** *118*
16. **Anesthesia** *120*
17. **Radiology** *122*
18. **Psychiatry** *123*
19. **Orthopedics** *125*
20. **Pediatrics** *127*

All Subject MCQs.....133-162

MCQs with Answers *135*

Quick Review Points.....163-187

3 Biochemistry

1. A 40-years-old woman presented with progressive palmoplantar pigmentation. X-ray spine shows calcification of intervertebral discs. On adding Benedict's reagent to urine, it gives greenish brown precipitate and blue-black supernatant fluid. Most likely diagnosis:

a. Phenylketonuria
b. Alkaptonuria
c. Tyrosinosis type II
d. Arginosuccinic aciduria

By the 3rd or 4th decade of life, patient with alkaptonuria may develop ochronosis (deposition of alkaptone bodies in intervertebral discs, cartilages of nose, pinna of ear). Diagnosis of alkaptonuria is suggested by blackish discoloration of urine, a positive Benedict's test, silver nitrate reduction and detection of elevated homogentisic acid by GC/MS (Gas chromatography/Mass spectrometry).

2. A 6-years-old patient presented with fatigue on normal outdoor activity. In blood there was raised triglycerides, increased cholesterol, fatty acid and lactate. Blood sugar was 60 mg/dL. USG shows enlarged liver and kidney. Liver biopsy showed increased glycogen. Most likely diagnosis:

a. Von-Gierke's disease b. Pompe's disease
c. Cori's disease d. McArdle's disease

In Von-Gierke's disease, there is fasting hypoglycemia that does not respond to stimulation by adrenaline. There is hyperlipidemia, lactic acidosis and ketosis. Glycogen gets deposited in liver and massive liver enlargement can lead to cirrhosis.

3. A patient had normal blood glucose level as estimated by Glucose-Oxidase Peroxidase method. Urine examination showed a positive Benedict's test. Most likely condition:

a. Fructosuria
b. Galactosemia
c. Denaturation of glucose
d. Faulty tests

Fructosuria is a benign metabolic defect due to deficiency of fructokinase. There is no abnormality other than excretion of fructose in urine. Urine gives positive Benedict's and Seliwanoff's tests.

4. A child was found to have hypoglycemia, hepatomegaly and accumulation of highly branched glycogen called limit dextrin. Most likely diagnosis:

a. Cori's disease b. Von-Gierke's disease
c. Anderson's disease d. McArdle's disease

Cori's disease/Limit dextrinosis is characterized by accumulation of highly branched dextrin, fasting hypoglycemia, hepatomegaly and myopathy.

5. An infant present with hepatosplenomegaly, hypoglycemia, hyperuricemia and lactic acidosis. Liver biopsy shows normal structured glycogen deposition. Which enzyme is deficient?

a. Debranching enzyme b. Branching enzyme
c. Glucose-6-phosphatase d. Muscle phosphorylase

Findings are suggestive of Von-Gierke's disease, which occurs because of deficiency of the enzyme Glucose-6-phosphatase.

6. A person on a fat free carbohydrate rich diet continues to grow obese. Which of the following lipoprotein is likely to be elevated in his blood?

a. Chylomicrons b. VLDL
c. LDL d. HDL

The lipid abnormalities in patients who are obese include elevated serum triglyceride, VLDL, apolipoprotein B, and non-HDL-C levels. The increase in serum triglycerides is due to increased hepatic production of VLDL particles and a decrease in the clearance of triglyceride rich lipoproteins.

7. A person was diagnosed with isolated increase in LDL. His father and brother had the same disease with increased cholesterol. Most likely diagnosis:

a. Familial type III hyperlipoproteinemia
b. Abetalipoproteinemia
c. Familial lipoprotein lipase deficiency type I
d. LDL receptor mutation

In type IIA hyperlipoproteinema (Primary Familial Hypercholesterolemia), there is elevation of LDL. The cause is LDL receptor defect. Receptor deficiency in liver and

Answers

1. b **2.** a **3.** a **4.** a **5.** c **6.** b **7.** d

JAYPEE BROTHERS

peripheral tissues will result in the elevation of LDL levels in plasma, leading to hypercholesterolemia.

8. A patient with abetalipoproteinemia frequently manifests with delayed blood clotting. This is due to inability to:
a. Produce VLDL
b. Synthesize fatty acids
c. Produce chylomicrons
d. Synthesize clotting factors

In abeta-lipoproteinemia, there are reduced levels of VLDL, LDL, B-48 and B-100. All apo-B containing lipoproteins are reduced since microsomal triglyceride transfer protein is defective.

9. A 48-years-old lady presented with bone pain and hepatosplenomegaly. On examination of biopsy specimen from spleen, crumpled tissue paper appearance is seen. Which product is likely to have accumulated?
a. Glucocerebroside
b. Sphingomyelin
c. Sulfatide
d. Ganglioside

In Gaucher's disease, there is beta-glucosidase deficiency leading to accumulation of glucocerebroside. There is hepatosplenomegaly, erosion of bone and moderate anemia. Gaucher cells have the appearance of signet rings with 'wrinkled tissue paper' because the nucleus is pushed to the periphery of the cells.

10. A 7-years-old boy presented with severe abdominal pain. On examination, he has xanthomas. Blood drawn for work up has milky appearance of plasma. Which lipoprotein is increased?
a. Chylomicron
b. Chylomicron remnants
c. LDL
d. HDL

Lipoprotein fraction elevated in a patient with type I hyperlipoproteinemia is chylomicron. Plasma after 24 hours shows creamy layer over clear plasma. Clinical features are eruptive xanthoma, hepatosplenomegaly and pain in abdomen.

11. In a person, LDL is highly elevated but the level of LDL receptors is normal. What could be the cause?
a. Phosphorylation of LDL receptors
b. ApoB100 mutation
c. Lipoprotein lipase deficiency
d. Cholesterol acyl CoA transferase deficiency

A mutation in apoB-100 that inhibits its binding to the LDL receptor is another genetic cause of elevations in LDL cholesterol.

12. If in a person, total cholesterol: 300 mg/dL, HDL: 25 mg/dL and triglyceride: 150 mg/dL. What would be the value of LDL?
a. 245 mg/dL
b. 125 mg/dL
c. 95 mg/dL
d. 55 mg/dL

LDL cholesterol = Total cholesterol – HDL cholesterol-Triglycerides

13. A 45-years-old male, blood sample gives red colour in Ehlrich's solution. The substance responsible is:
a. Urobilinogen
b. Conjugated bilirubin
c. Unconjugated bilirubin
d. Haemosiderin

Bilinogens (Urobilinogen and stercobilinogen) react with Ehlrich's aldehyde reagent (para-dimethyl amino benzaldehyde) to form red color.

14. If tyrosine level in blood is normal without external supplementation, deficiency of which of the following is ruled out?
a. Tryptophan
b. Phenylalanine
c. Histidine
d. Isoleucine

Tyrosine is formed from phenylalanine by the action of the enzyme phenylalanine hydroxylase. So if sufficient phenylalanine is supplied in diet, tyrosine level would be normal in the body.

15. Sickle cell anemia is the clinical manifestation of homozygous genes for an abnormal hemoglobin molecule. The event responsible for the mutation in the B-chain is:
a. Insertion
b. Deletion
c. Non-dysjunction
d. Point mutation

Sickle cell anemia is caused by point mutation. In the beta chain of the hemoglobin, the 6th amino acid normally is glutamate. In sickle-cell anemia, this is altered to valine. In the DNA, this is seen as a change from normal T replaced by abnormal A nucleotide (T to A substitution).

16. A 10-years-old child with aggressive behavior and poor concentration is brought with presenting complaints of joint pain and reduced urinary output. Mother gives history of self mutilation behavior stating that he tends to mutilate his fingers. Enzyme deficiency in such a case:
a. HGPRTase
b. Adenosine deaminase
c. APRTase
d. Acid maltase

Lesch-Nyhan syndrome is characterized by self-mutilation, mental retardation, excessive uric and nephrolithiasis. Gout develops in later life. There is deficiency of hypoxanthine guanine phosphoribosyl transferase.

17. A 4-years-old child diagnosed with Duchenne muscular dystrophy, an X-linked recessive disorder. Genetic analysis shows that the patient's gene for the muscle protein dystrophin contains a mutation in its promoter region. Most likely effect of this mutation:
a. Tailing of dystrophin mRNA with be defective
b. Capping of dystrophin mRNA will be defective
c. Termination of dystrophin transcription will be deficient
d. Initiation of dystrophin transcription will be deficient

Duchenne muscular dystrophy/DMD is a degenerative disease of muscle affecting only male children. The gene is

Answers

8. a	**9.** a	**10.** a	**11.** b	**12.** b	**13.** a	**14.** b
15. d	**16.** a	**17.** d				

JAYPEE BROTHERS

in the middle of the short arm of X-chromosome. This gene produces a protein called dystrophin with 3700 amino acids. In DMD patients, the gene for dystrophin is mutated. These mutations affect the normal transcription of dystrophin.

18. A lady presented with fatigue and tingling sensation in both hands and legs. On examination, she is found to have a fissured red tongue, lesions at angle of mouth with a decreased RBC glutathione reductase activity. Likely vitamin deficiency:

a. Riboflavin b. Thiamine
c. Vitamin B_{12} d. Vitamin B_6

Manifestations of riboflavin (vitamin B_2) deficiency include glossitis, magenta colored tongue, cheilosis (redness and shiny appearance of lips), angular stomatitis (lesions at muco-cutaneous junction at corners of mouth) and cirumcorneal vascularization. Proliferation of the bulbar conjunctival capillaries is the earliest sign of riboflavin deficiency. Glutathione reductase (RBC) is an FAD (Flavin adenine dinucleotide) requiring enzyme, which is the marker for vitamin B_2 deficiency.

19. A child was weaned from breast milk on the fifth day and was given sugar cane juice. The child developed hypoglycemia and hepatomegaly. Biochemical examination showed hypophosphatasia and reducing substances in urine. Likely enzyme deficiency:

a. Aldolase B b. Fructokinase
c. Glucose-6-phosphatase d. Beta-galactosidase

In hereditary fructose intolerance, the defect is in aldolase-B, hence fructose-1-phosphate cannot be metabolized. This is seen when sucrose (containing fructose) is introduced in the diet of the infants, usually around 6 months of age. Accumulation of fructose-1-phosphate will inhibit glycogen phosphorylase. This leads to accumulation of glycogen in liver and associated hypoglycemia. Fructose is also excreted in urine when urine gives positive Benedict's test.

20. A 28-years-old female presented with obstructive jaundice. Which of the following type of reaction will be seen in Van Der Bergh test?

a. Direct positive b. Indirect positive
c. Both positive d. Biphasic

Van Der Bergh reaction is direct positive in conjugated hyperbilirubinemia. Obstructive jaundice causes conjugated hyperbilirubinemia.

21. In lead poisoning, there is inhibition of some of the enzymes of the heme biosynthetic pathway. This is reflected by the accumulation of:

a. Uroporphyrinogen III b. Ferrochelatase
c. Porphyrobilinogen d. Delta amino levulinic acid

Lead inhibits heme synthesis. Basophilic stippling of red cells is seen in peripheral blood and bone marrow smears. This is due to agglutination of ribosomes. Globin synthesis is adversely affected. Lead particularly inhibits delta aminolevulinic acid (ALA) synthase and ALA-dehydratase.

22. A 10-years-old boy presented with muscle weakness and fatigue with increased lead in blood. Which of the following enzyme production in liver is increased?

a. Ferrochelatase b. PBG deaminase
c. Heme oxygenase d. ALA synthase

Porphyria can result from lead poisoning (acquired porphyria). Most of the paints contain lead more than the permitted levels. Children suck painted toys; and they get the poison. The toxic effect of lead is due to inhibition of ferrochelatase. So, there is decreased level of heme with consequent increased activity of ALA synthase.

23. A 4-years-old boy of first-degree consanguineous couple presented with complaints of backache and bilateral knee pain. All blood investigations were normal. Urine routine microscopy is normal. However, on keeping urine outside for sometimes, it turned black. Which of the enzyme is likely to be deficient in such a patient?

a. Xanthine oxidase
b. Homogentisate oxidase
c. Tyrosinase
d. Fumaryl-acetoacetate hydroxylase

The patient is suffering from alkaptonuria, which is because of deficiency of homogentisate oxidase. Urine becomes dark on exposure to air.

24. A young male presented with pain in calves during excessive exercise without any other symptom or sign. Muscle biopsy shows increased glycogen. The enzyme deficient is:

a. Debranching enzyme
b. Muscle phosphorylase
c. Glucose-6-phosphorylase
d. Muscle phosphofructokinase

In type V glycogen storage disease (McArdle's disease), there is exercise intolerance, accumulation of glycogen in muscles and myoglobinuria. This occurs because of deficiency of the enzyme muscle phosphorylase (skeletal muscles).

25. A man complaint of diarrhea with dairy products. He must avoid all *except*:

a. Condensed milk b. Skimmed milk
c. Yogurt d. Ice cream

The person is suffering from lactose intolerance, which is because of deficiency of the enzyme lactase. In this condition, lactose accumulates in the gut. Irritant diarrhoea

Answers

18. a **19.** a **20.** a **21.** d **22.** d **23.** b **24.** b
25. c

JAYPEE BROTHERS

and flatulence are seen. If milk is withdrawn completely, diarrhoea will be limited. Curd is an effective treatment, because the lactobacilli present in the curd contains the enzyme lactase. Lactase is abundantly seen in yeast, which could also be used for treatment.

26. A patient presents with inability to convert pyruvate to Acetyl CoA. Treatment of this condition is with the supplementation of:

a. Thiamine
b. Biotin
c. Free fatty acids
d. Vitamin B_6

The coenzyme form of the enzyme pyruvate dehydrogenase is TPP (thiamine pyrophosphate). This enzyme is used in oxidative decarboxylation of alpha keto acids, e.g., pyruvate dehydrogenase catalyzes the breakdown of pyruvate to acetyl CoA, and carbon dioxide.

27. After a fatty meal in a patient with lipoprotein lipase deficiency, which of the following will be raised?

a. HDL
b. LDL
c. IDL
d. Chylomicrons

The dietary triglycerides are transported by chylomicrons. The lipoprotein molecules are broken down by the lipoprotein lipase present on the capillary wall. Lipoprotein lipase hydrolyzes triglycerides present in chylomicrons into fatty acids and glycerol.

28. Glycine is present in all of the following *except*:

a. Creatine
b. Purine
c. Glutamine
d. Glutathione

Glutamine was isolated as free amino acid from beetroot by Schulze and Bosshard in 1833. Glutamine was identified as a member of all proteins by Charles Chibnall and Manayath Damodaran in 1932. The amidation of glutamic acid to glutamine is catalyzed by the enzyme glutamine synthetase.

29. Insulin increases activity of all *except*:

a. Phosphofructokinase-1
b. Glucokinase
c. Pyruvate carboxylase
d. Acetyl CoA carboxylase

During gluconeogenesis, carboxylation of pyruvate to oxaloacetate is catalyzed by a mitochondrial enzyme, pyruvate carboxylase. This enzyme needs coenzyme biotin and energy by ATP hydrolysis. Insulin inhibits gluconeogenesis, so it will not increase activity of an enzyme involved in gluconeogenesis (pyruvate carboxylase).

30. Hay's Sulphur test is used to detect:

a. Bile salts in urine
b. Reducing sugars in urine
c. Ketone bodies in urine
d. Urobilinogen in urine

Normally bile salts (sodium salts of taurocholic acid and glycocholic acid) are present in the bile; but are not seen in urine. Bile salts in urine are detected by Hay's test. Positive Hay's test indicates the obstruction in the biliary passages causing regurgitation of bile salts into the systemic circulation leading to excretion in urine.

31. In a person fasting overnight with carnitine deficiency, following chemical increase in blood:

a. Glucose
b. Fatty acids
c. Amino acids
d. Ketone bodies

Carnitine deficiency is noted in preterm infants, in whom impaired fatty acid oxidation is noticed and hence fatty acids levels would increase. Also, more glucose is utilized, resulting in episodes of hypoglycemia.

32. Vitamin B_1 is required for which reaction?

a. Transamination
b. Oxidative decarboxylation
c. Carboxylation
d. Reduction

The co-enzyme form of the enzyme pyruvate dehydrogenase is TPP (thiamine pyrophosphate). This enzyme is used in oxidative decarboxylation of alpha keto acids, e.g., pyruvate dehydrogenase catalyzes the breakdown of pyruvate to acetyl CoA, and carbon dioxide.

33. Which vitamin is synthesized in-vivo in the body by humans?

a. Folic acid
b. Niacin
c. Pantothenic acid
d. Cyano-cobalamin

The richest natural sources of niacin are dried yeast, rice polishing, liver, peanut, whole cereals, legumes, meat and fish. About half of the requirement is met by the conversion of tryptophan to niacin. About 60 mg of tryptophan will yield 1 mg of niacin.

34. Accumulation of increased amount of sphingomyelin in liver and spleen is found in:

a. Gaucher's disease
b. Niemann-Pick disease
c. Cori's disease
d. Von-Gierke's disease

Niemann- Pick disease is because of deficiency of the enzyme sphingomyelinase. As a result of this, sphingomyelin accumulates in the body. Clinical features include severe CNS damage, mental retardation, hepatosplenomegaly and Cherry red spots in macula. Death occurs by 2 years of age.

JAYPEE BROTHERS

Answers

26. a	**27.** d	**28.** c	**29.** c	**30.** a	**31.** b	**32.** b
33. b	**34.** b					

detailed information on PGMEE books, visit our website www.jaypeebrothers.com, for detailed information on PGMEE books, visit our websi

Self-Assessment & Review of

FMGE/MCI Screening Examination SUPPLEMENT

Salient Features

- IMAGE BASED MCQs segment is composed of image-based questions asked in the examination.
- PROBLEM BASED MCQs contains subject-wise MCQs with explanation. Only those MCQs are kept in this section, which relates to a clinical case-based problem.
  - Explanations are short and concise and tries to highlight the fact that why a particular option is the answer to that MCQ.
  - For the ease of studying, explanations are placed after the MCQs
- ALL SUBJECT MCQs contain MCQs randomly picked from the subjects. There is no explanation with the MCQs.
- QUICK REVIEW POINTS contains important and commonly asked one-liner type of questions, meant for quick revision. Most of these points are from the previous 3 segments.

Printed in India

Available at all medical bookstores
or buy online at www.jaypeebrothers.com



JAYPEE BROTHERS
Medical Publishers (P) Ltd.
EMCA House, 23/23-B, Ansari Road,
Daryaganj, New Delhi - 110 002, INDIA
www.jaypeebrothers.com

Join us on facebook.com/JaypeeMedicalPublishers

