

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS OF COMPETITIVE EXAMINATION FOR THE POST OF ASSISTANT PROFESSOR (Super Speciality) PEDIATRIC HEPATOLOGY MEDICAL EDUCATION DEPARTMENT

1. Clinical Decision Making-

- Evaluation of pediatric patients with Neonatal Cholestasis, Infantile cholestasis, Chronic Liver Disease, Acute on chronic liver failure and Acute liver failure.
- Basics of Liver, Biliary Tract and Pancreatic Imaging, Assessment of Hepatic outcome, Ethics & Consent.

2. Basics of Pediatric Hepatology-

Anatomy and Architecture of the liver

- Macroscopic anatomy of the liver; Liver and biliary tract histology;
- Ultrastructure of the hepatocyte and other cells [Liver sinusoidal endothelial cells, Kupffer cells, The hepatic stellate cell, Biliary epithelial cells, Hepatic stem cells];
- Embryology of the liver and Biliary tract
- Postnatal Maturity of Liver

Functions of the liver

- Hepatic circulation [Regulation of hepatic blood flow, Hepatic microcirculation, Hepatic lymph and lymphatics]
- Functions of the liver [Functional organization of the liver, Cell biology and molecular biology of the liver cells, Hepatic transport processes, Modulation of liver function by hepatic nerves, In vitro techniques: isolated organ perfusion, slices, cells and subcellular elements].
- Metabolism: [Carbohydrates and fat metabolism and the liver, Lipoprotein metabolism, Protein and amino acid metabolism, Mitochondria and energy formation]
- Liver-specific functions [Bilirubin metabolism, Metabolism of bile acids, Ammonia, urea production and pH regulation, Protein synthesis and degradation in the liver, Glutathione, Haem biosynthesis and excretion of porphyrins, Metabolism of endo/xenobiotics, Vitamins and the liver, Normal iron metabolism, Normal copper metabolism and reducing copper to subnormal levels for therapeutic purposes, Trace elements and the liver, Hepatic metabolism of drugs].
- Synthetic functions of liver [Albumin and other carrier proteins, The liver and coagulation, Function and metabolism of collagen and other extracellular matrix proteins]
- Regulation of the liver cell mass [Control of liver cell proliferation, Regeneration of acute and chronically injured liver].

- Excretion [Bile salt synthesis, Physiology of bile formation and various bile transporters, Motility of the GB and biliary tree].
- Immunology of the liver [Cytokines in liver physiology and liver pathology, Intrahepatic lymphocytes, Antibody production and transport in the liver]

Basic concepts in Pathology of Liver

- Basic Histological features
- Classifications, scoring systems and morphometry in liver pathology in various diseases

Investigation of hepatobiliary diseases

- Signs and symptoms of liver disease
- Biochemical investigations in the management of liver disease
- Hepatic removal kinetics: importance for quantitative measurements of liver function
- Immunological investigations in liver diseases
- Biopsy (both percutaneous and Trans jugular) and laparoscopy
- Imaging of the liver [Ultrasonography, Computerized tomography imaging of the liver, Magnetic resonance imaging, Angiography, Positron emission tomography of the liver]
- Endoscopic retrograde cholangiopancreatography, Interventional radiology in hepatobiliary diseases, Splanchnic and hepatic haemodynamic investigations
- Noninvasive assessment of liver fibrosis – serum markers, transient elastography, shear elastography, ARFI

Cirrhosis-General

- Evolution of cirrhosis
- Cellular and molecular pathobiology of liver fibrosis and its pharmacological intervention
- Clinical and diagnostic aspects of cirrhosis

3. Portal hypertension and its complications-

- Anatomy of the portal venous system in portal hypertension
- Pathogenesis of portal hypertension
- Clinical manifestations and management and prophylaxis of bleeding episodes in cirrhotics [Variceal and nonvariceal]
- Haemodynamic assessment of portal hypertension
- Pathogenesis, diagnosis and treatment of ascites in cirrhosis
- Pathogenesis, diagnosis and treatment of SBP and variants in cirrhosis
- Pathogenesis, diagnosis and treatment of Hepatic encephalopathy
- Pathogenesis, diagnosis and treatment of Hypersplenism
- Pathogenesis, diagnosis and treatment of Hepato-pulmonary syndrome
- Portopulmonary hypertension.

- Pathogenesis, diagnosis and treatment of Bacterial infections in portal hypertension
- Pathogenesis, diagnosis and treatment of acute kidney injury and Hepato-renal syndrome

4. Pediatric and Neonatal Acute liver failure and Pediatric ACLF-

- Etiopathogenesis, and management of Pediatric Acute liver failure and related syndromes

5. Neonatal Cholestasis Syndrome Etiopathogenesis, Diagnosis and Management-

6. Viral infections of the liver-

- Structure, replication and laboratory diagnosis [Hepatitis B virus and hepatitis D virus, Hepatitis C virus, Hepatitis A, Hepatitis E and Non Hepatotropic viruses]
- Prevention and treatment of viral hepatitis [Vaccines against hepatitis A, Hepatitis B vaccines and immunization, HCV and HEV vaccines]
- Therapy of acute viral hepatitis
- Therapy of chronic hepatitis B and C
- Human immunodeficiency virus and the liver
- Biliary Ascariasis, visceral larva migrans, strongyloidiasis, capillariasis etc

7. Structural defects-

Biliary Atresia, Choledochal cyst

- Fibrocystic Diseases (Caroli disease, Congenital hepatic fibrosis, Caroli syndrome), Polycystic kidney and Liver disease

08. Immune disorders of the liver: Pathogenesis, diagnosis and treatment of:-

- Autoimmune hepatitis
- Primary/Autoimmune Sclerosing cholangitis
- Other Cholestatic Disorders:
 - Paucity of Bile duct: Syndromic and Non Syndromic variety
 - Vanishing bile duct syndrome
 - Neonatal Sclerosing Cholangitis'
 - Giant Cell hepatitis
 - IgG4 related diseases

09. Vascular diseases-

- Obstruction of the portal vein
- Disorders of the hepatic veins, IVC and hepatic sinusoids
- Congenital porto-systemic malformations and shunts

10. Hepatic steatosis-

- Pathogenesis, diagnosis and treatment of Non-alcoholic fatty liver and non-alcoholic steatohepatitis

11. Tumours of the liver-

- Benign hepatic tumors [haemangioma, Hemangioendothelioma etc.]
- Malignant tumors [Hepatoblastoma, Hepatocellular Carcinoma etc.]
- Prevention and Screening strategies for HCC in children with chronic liver disease

12. Genetic and Metabolic diseases-

- Wilson disease
- Inherited disorders of Cholestasis
- Carbohydrate Metabolic defects: Galactosemia, Hereditary Fructose Intolerance, Glycogen storage disorder
- Fatty acid Oxidation Defects and Mitochondriopathy
- Urea Cycle disorders
- Gluconeogenic defects
- Lipid storage and Lysosomal storage disorders
- Disorders of Indirect and direct Hyperbilirubinaemia
- Pathogenesis, diagnosis and treatment of Iron Storage Diseases
- Cystic fibrosis and Alpha-1 Antitrypsin Deficiency related Liver Disease
- Hereditary Porphyrias

13. Biliary and Pancreatic diseases-

- a. Anatomy, Embryology and Congenital Malformations of Bilio-pancreatic system
- b. Pancreas:
 - i. Acute/Chronic Pancreatitis
 - ii. Cystic Lesions of pancreas
 - iii. Benign/Malignant lesions of pancreas
- c. Biliary Tree:
 - i. Pathogenesis, diagnosis and treatment of Gallstone disease
 - ii. Pathogenesis, diagnosis and treatment of Cholangitis and biliary tract infections
 - iii. Biliary Malignancy

14. Toxic liver injury-

- a. Pathogenesis, diagnosis and treatment of Drug-induced liver injury and Toxic liver injury
 - i. Including hepatic injury due to physical agents and indigenous or herbal medicines

15. Nutritional assessment and role of nutrition in liver and biliary disease-

16. Systemic Diseases and Liver-

- a. Hepatic granulomas
- b. The liver in cardiovascular disease
- c. The liver in lung diseases
- d. Effect of gastrointestinal diseases on the liver and biliary tract
- e. Total parenteral nutrition-related liver disease (IFALD)

- f. Skin diseases and Liver
- g. The effect of haematological and lymphatic diseases on the liver
- h. The liver in graft-vs-host disease
- i. The effect of endocrine diseases on liver function
- j. Musculoskeletal diseases and the liver

17. Impact of liver disease on other systems-

- The effect of liver disease on the cardiovascular system
- The effect of liver disease on the endocrine system
- Haematological abnormalities in liver disease
- Haemostasis in liver disease
- The effect of liver disease on the gastrointestinal tract
- The effect of liver disease on the skin
- Effect of liver on the urogenital tract
- The nervous system in liver disease
- The effect of liver disease on bone
- The effect of liver disease on nutritional status and energy metabolism

18. Maternal Disease and impact on Pediatric Liver Disease-

19. Surgery, anesthesia and pediatric liver disease-

- General surgical aspects and the risks of liver surgery in patients with hepatic disease
- Anaesthesia and liver disease
- Postoperative jaundice
- Hepatobiliary trauma

20. Liver Transplantation: -

- Historical Aspects
- Surgical anatomy of Liver
- Current Indications, Contraindications, and Timing for Liver Transplantation
- Pretransplantation Evaluation
- Hepatic, Pulmonary, Cardiac, Psychiatric and Renal evaluation
- Infectious Disease Screening: Candidates and Donors [deceased and living]
- Pretransplant Optimisation for Pediatric Liver Transplantation
- Nutritional Rehabilitation
- Immunisation
- Portal Hypertension Management

Specific Indications of LT in Children-

- Acute Liver Failure
- Biliary Atresia and other Cholestatic Liver Diseases
- Metabolic Liver Disease
- Hepatic Malignancy
- Autoimmune Liver Disease

- Budd Chiari Syndrome
- Unusual Indications- Polycystic liver disease; Fibrocystic Disorders; Benign Tumors; Hematological Diseases; Vascular disorders [Hereditary hemorrhagic telangiectasia; Veno-occlusive disease]; etc.]

Immunology of Liver Transplantation-

- Principles of Immunosuppressive Therapy
- Induction and Maintenance of Immunosuppression
- Including Novel Therapies

Post LT Complications: -

- Early Graft Failure: Etiology, Recognition, and Treatment
- Vascular Complications
- Infections
- Biliary problems
- Neurological Disorders - Diagnosis and Management
- Histopathology of Liver Transplantation
- Patterns of Rejection and Other Causes of Liver Dysfunction
- Pathophysiology, diagnosis and Treatment of Acute and Chronic Rejection
- Including Antibody Mediated Rejection
- Late Onset Graft Dysfunction:
- Recurrent Disease; Metabolic Syndrome etc.
- Special Situations: Post Transplant Lymphoproliferative Disorder Graft versus Host Disease

21. Procedures-

Transabdominal USG+ Upper GIE/Sigmoidoscopy+ Colonoscopy, HVPG, percutaneous and Transjugular Liver Biopsy, Therapeutic endoscopy: Variceal ligation, sclerotherapy, glue injection, polypectomy, foreign body removal and ERCP

Pattern of Question Papers:

- 1. Objective Type Paper**
- 2. Maximum Marks: 150**
- 3. Number of Questions: 150**
- 4. Duration of Paper: 2.30 Hours**
- 5. All Questions carry equal marks**
- 6. There will be Negative Marking**

(For every wrong answer one-third of the marks prescribed for that Particular question shall be deducted.)
