

UPSC Medical Sciences Optional 2023 QUESTION PAPER

PAPER I (Anatomy/Biochemistry/Physiology)

SECTION A

QUESTION 1

1.a. A 35-year-old male smoker with complaints of difficulty in swallowing and ulcer on tip of his tongue for last one month, visits an ENT surgeon. Based on his clinical examination and histopathological investigation of tongue lesion, he is diagnosed as a case of carcinoma of tongue with cervical lymphadenopathy.

(i) Using a flowchart, show the principal lymph node involved and its further distribution. (5)

(ii) Explain the role of the tongue in swallowing. (5)

1.b. Describe the following in the context of Auditory pathway:

(i) Its course from internal ear to auditory cortex (5)

(ii) Blood supply of the auditory cortex (5)

1.c. Discuss the sources and RDA of Folic acid and clinical manifestations of its deficiency in the body. Add a note on FOLATE TRAP. (10)

1.d. Describe the role of the cerebellum in control of voluntary movement. Add a note on cerebellar dysfunction. (6+4)

1.e. Describe the genesis of REM sleep. Why is REM sleep called paradoxical sleep? (10)

QUESTION 2

2.a. A 56-year-old male visits a surgery OPD with complaints of difficulty in the passage of urine especially on straining. Based on his clinical examination and ultrasound findings, he is diagnosed with Benign hypertrophy of Prostate.

(i) What is the anatomical basis of his urinary problems? (5)

(ii) Describe the relations of the Prostate gland. (5)

(iii) Describe the blood supply and lymphatic drainage of the Prostate gland. (5)

2.b. (i) Describe the biochemical role of copper in the body. Discuss briefly about Wilson's disease and the biochemical investigations that will help in its diagnosis. (10)

2.b. (ii) Define Genetic code and explain the Wobble Hypothesis. Discuss briefly the post-translational modifications of proteins (10)

2.c. Explain the physiological changes that occur in a mother during pregnancy, under the following headings:

(i) Genital organs (5)

(ii) Blood and its constituents (5)

(iii) Cardiovascular system (5)

QUESTION 3

3.a.i) Describe the following regarding the knee joint :

(I) All movements including locking and unlocking with muscles responsible for each (5)

(II) Role of cruciate ligaments in movement and stability (5)

3.a.ii) Describe Carpal Tunnel Syndrome under the following headings:

(I) Causes and structure(s) involved (5)

(II) Clinical features (5)

3.b.(i) Explain the principle and steps of Polymerase Chain Reaction (PCR). Write its clinical applications. (10)

3.b.(ii) Discuss the serum biochemical markers of cholestasis (5)

3.c.i. Describe the intrinsic regulation of cardiac output (10)

3.c.ii. Discuss the factors regulating erythropoiesis (5)

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QUESTION 4

4.a.i. Describe the role of SRY transcription factors in testicular development (10)
4.a.ii. Describe vitelline duct abnormalities (5)

4.b.i. Describe the role of iodine in the synthesis of thyroid hormones. Discuss briefly about Hashimoto's Thyroiditis and the biochemical investigations that will be done for its diagnosis. (15)
4.b.ii Explain briefly the biochemical role of Vitamin-K in the body. What is the biochemical basis of using Warfarin as an anticoagulant drug ? (5)

4.c.i. Describe the functions of vasopressin and the regulation of vasopressin secretion (5)
4.c.ii. Describe the physiological effects of glucagon (5)

SECTION B (Pathology/Forensic Medicine/Pharmacology/Microbiology)

QUESTION 5

5.a. Enumerate various classes of antihypertensive drugs. Briefly discuss the role of calcium channel blockers in the treatment of hypertension (5+5)

5.b.i. Describe mechanism of T-cell mediated immune response in Type IV hypersensitivity reaction. Explain it by giving example of tuberculin testing. (5)
5.b.ii. List the clinical diseases caused by typhoidal and non-typhoidal Salmonellae. Discuss the Widal test and its interpretation. (2+3)

5.c. Enumerate four disturbances of growth. Describe the mechanism of Atrophy (5+5)

5.d. A 25-year-old male presented to emergency with history of fever, neck stiffness, headache and vomiting. On examination, patient was in altered sensorium. Neck rigidity was present. CSF examination showed cobweb formation. Microscopy showed lymphocytosis. Biochemical examination showed decreased glucose and increased protein.
(i) What is the likely diagnosis? (2)
(ii) Name the special stain on CSF useful in confirmation of diagnosis and write the finding. (3)
(iii) Describe the diagnostic gross pathology of the likely affected organ (5)

5.e. Enumerate types of Blood group systems used for identification and paternity testing (10)

QUESTION 6

6.a.i. Enumerate five risk factors for oral cancer. Describe its morphology. (5+5)
6.a.ii. Enumerate five causes of membranous glomerulonephritis. Describe its morphology? (5+5)

6.b. State the therapeutic indications, drug interactions and side effects of
(i) Aspirin (5)
(ii) Cyclosporine (5)

6.c.i. Discuss various stages in the asexual life cycle of plasmodium falciparum. Describe the principle, advantages and disadvantages of non-microscopic Rapid Diagnostic Test for diagnosis of Malaria (5+5)
6.c.ii. Enumerate Human Herpes Viruses (HHV) with their primary target cells. How will you approach to diagnose a case of HSV infection in the laboratory? (4+6)

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QUESTION 7

7.a. Classify the various types of poisons. Enumerate the features of Plumbism. Discuss the tests that will show/establish the onset of early stages of Pb poisoning. (5+5+5)

7.b.i. A 29-year-old female presented with fever, multiple episodes of epistaxis and gum bleeding since one month. On examination, her temperature was 37.6°C, Skin showed multiple bruises. CBC showed Hb – 8.2 g/dL, WBC count - 60,000/muL. Peripheral smear showed 75% blasts. They had fine cytoplasmic azurophilic granules and Auer rods.

(I) What is the most likely diagnosis? (2)

(II) Enumerate the cytochemical stains useful in this disease. (4)

(III) Write two cytogenetic abnormalities with favorable prognosis. (2)

(IV) Mention two cytogenetic abnormalities with unfavourable prognosis. (2)

7.b.ii. Describe the etiopathogenesis and microscopic findings in affected heart of rheumatic heart disease. (5+5)

7.c.i. Discuss the management of complicated plasmodium falciparum malaria. (10)

7.c.ii. Discuss the therapeutic indications and adverse effects of Insulin (5)

QUESTION 8

8.a.i. Describe the morphological characteristics of Cryptococcus neoformans on microscopic examination. Discuss the pathogenesis of Cryptococcosis. (5+5)

8.a.ii. Define meningococcaemia. Discuss laboratory diagnosis of acute meningococcal meningitis. Briefly write about the meningococcal vaccines to prevent the disease. available. (2+5+3)

8.b.i. Define 'Injury', 'Hurt' and 'Grievous hurt' as per the Indian Penal Code. Write a short note on secondary markings on fired bullet. (6+4)

8.b.ii. Enumerate different types of finger impressions. Write a short note on DNA fingerprinting (2+8)

8.c.i. Elaborate on the mechanism of action of Potassium-sparing diuretics. (5)

8.c.ii. Briefly describe the therapeutic indications and adverse effects of Zidovudine (5)

UPSC Medical Sciences Optional 2023 QUESTION PAPER

PAPER II

SECTION A (General Medicine/Dermatology and Paediatrics)

QUESTION 1

1.a.(i) Enlist the clinical features of dengue fever. (5)

1.a.(ii) Outline the management of a patient with dengue haemorrhagic fever. (5)

1.b. write the symptoms of Schizophrenia (10)

1.c.(i) What is the full form of IMNCI and what are its objectives? (4)

1.c.(ii) What are the components of integrated care provided under IMNCI? (6)

1.d. State the immunization schedule under the National Immunization Programme for infants and children.(10)

1.e. A 40-year-old male presented with multiple itchy, violaceous, flat-topped papules over skin for last one year. He also complained of burning sensation in mouth.

(i) Diagnose this condition (2)

(ii) What are the oral findings which can be associated with this condition? (3)

(iii) Outline its management. (5)

Question 2

2.a. A 30-year-old female has been brought to medical emergency with a history of low grade fever, headache, anorexia and weight loss for the last one month. She has also developed diplopia and altered sensorium for the last two days

(i) What is the most likely diagnosis? (2)

(ii) Enumerate the investigations required to confirm the diagnosis. (6)

(iii) Differentiate between the CSF findings in pyogenic, tubercular and viral meningitis. (6)

(iv) Outline the treatment plan in this patient (6)

2.b. A 2-year-old boy was brought to the emergency with the complaints of sudden onset of respiratory distress with irritability. On examination, the child is disoriented and he has both peripheral and central cyanosis. He has deep sighing respiration with SpO₂ 65% at room air. On oxygen therapy his SpO₂ is increased to 80%. He has no organomegaly or neurological deficit.

(i) Write the complete diagnosis of this boy. (2)

(ii) How will you manage this case in emergency (8)

(iii) Classify the congenital cyanotic heart diseases (5)

2.c. A 48-year-old male presented with yellowish, greasy scales and redness over the scalp.

(i) What is the most likely diagnosis? (2)

(ii) Mention the sites of involvement in this disease (4)

(iii) Name the organism responsible for the pathogenesis of this disease (2)

(iv) Outline its treatment. (7)

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PAPER II

SECTION A (General Medicine/Dermatology and Paediatrics)

QUESTION 3

3.a. Discuss in short the etiology, clinical features, investigations and management of Chronic renal failure (5+5+5+5)

3.b.(i) Write the causes of unconjugated hyperbilirubinremia in a newborn (9)
3.b.(ii) What is the mechanism of action of phototherapy in the treatment of hyperbilirubinemia? (3)
3.b.(iii) What are the potential complications of the phototherapy? (3)

3.c.(i) Mention the nail findings in psoriasis (5)
3.c.(ii) Discuss topical and systemic therapies in psoriasis (10)

QUESTION 4

4.a. 20-year-old male has presented to the medicine OPD. He has complaints of episodes of breathlessness associated with tightness of chest and wheezing since the childhood. These episodes occurred commonly during the change of season.

(i) What is the most probable diagnosis? (2)
(ii) How will you confirm the diagnosis? (3)
(iii) Discuss in short the clinical features of the disease (5)
(iv) Outline the stepwise approach to the management of the disease. (10)

4.b.(i) What are the criteria for the identification of severe acute malnutrition (SAM) in children 6 months to 59 months of age? (5)
4.b.(ii) Enumerate the criteria for admission in the facility based care for severe acute malnutrition (5)
4.b.(iii) Write ten steps in the management of SAM (10)

4.c. Discuss in short the role of X-ray imaging in diagnosing a case of acute abdomen (10)

SECTION B (General Surgery/OBG/PSM)

QUESTION 5

5.a. A 65-year-old lady has progressively increasing dysphagia for last 6 months. She also has significant weight loss. How will you investigate her? (10)

5.b. 42-year-old male known case of alcoholic liver disease with portal hypertension, is brought to casualty with severe haematemesis. Describe the management of this case (10)

5.c.(i). Name any five risk factors associated with pelvic organ prolapse. (5)
5.c.(ii) Enlist the management options for a 60-year-old postmenopausal lady with procidentia with cystocele with enterocoele with rectocoele. (5)

5.d. Define chronic pelvic pain. What are the various causes of chronic pelvic pain in women? (10)

5.e. The Janani-Shishu Suraksha Karyakram is a unique national initiative of the Government of India. State in brief the entitlements to pregnant women and neonates under this scheme. (10)

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QUESTION 6

6.a.(i) Enumerate the causes for postpartum haemorrhage (PPH). (10)

6.a.(ii) Discuss the management of PPH (10)

6.b.(i) Enumerate the signs of lower limb arterial ischaemia. (5)

6.b.(ii) Briefly outline the diagnostic workup in a 62-year-old male with atherosclerotic lower limb peripheral arterial disease. (5)

6.b.(iii) State the management of this case(5)

6.c. The National Rural Health Mission is committed towards improving rural healthcare delivery system in the country. State the major initiatives that have been undertaken under this Mission to strengthen the healthcare infrastructure in rural areas. (15)

QUESTION 7

7.a.(i) Enumerate the causes of radio-opacities on a plain abdominal radiograph (5)

7.a.(ii) Enlist the causes of hydronephrosis in adults. (5)

7.a.(iii) How would you investigate an adult patient with unilateral right-sided hydronephrosis? (5)

7.a.(iv) State in brief the management of PUJ obstruction. (5)

7.b.(i) What are essential amino acids? List any six (5)

7.b.(ii) When is a protein said to be biologically complete? What does the term 'supplementary action of proteins' mean? Explain this concept by citing an example from daily life. (10)

7.c.(i) What are the methods for screening of cancer cervix? (5)

7.c.(ii) What are the risk factors for cervical cancer? (5)

7.c.(iii) Enlist the preventive strategies for cancer cervix (5)

QUESTION 8

8.a. State the vision, goals and objectives of the National Framework for Malaria Elimination in India, 2016-2030. What are the milestones and targets to be met under this framework by the years 2024, 2027 and 2030? Outline the broad strategies of this national framework. (20)

8.b.(i) How do you grade anaemia in pregnancy based on the haemoglobin levels as per the World Health Organization? (5)

8.b.(ii). List the complications of anaemia in pregnancy (5)

8.b.(iii). Briefly outline the management of a pregnant woman with severe anaemia in labour. (5)

8.c.(i) Enumerate the therapeutic indications of splenectomy (5)

8.c.(ii) Briefly mention the aetiopathogenesis and prophylaxis of overwhelming postsplenectomy infection (OPSI) syndrome (10)