

UPSC MEDICO

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**2022 UPSC MEDICAL SCIENCES OPTIONAL PAPER**

**PAPER I (Anatomy/Biochemistry/Physiology)**

**SECTION A**

**QUESTION 1**

1.a. Discuss the stomach under the following headings:

- (i) Peritoneal relations
- (ii) Blood supply
- (iii) Lymphatic drainage (15)

1.b. Discuss the regulation of secretion and physiological functions of growth hormone (10)

1.c. Define the physiological jaundice of the newborn. What are the predisposing causes and effects of this condition? (10)

1.d. Discuss in brief the developmental anomalies of the kidney and the ureters. (5)

1.e. Discuss the physiological functions of placental hormones in pregnancy. (10)

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**QUESTION 2**

2.a. Describe the anatomy of uterus under the following headings : (15)

- (i) Gross features
- (ii) Relations of the uterus
- (iii) Ligaments and supports
- (iv) Blood supply
- (v) Lymphatic drainage
- (vi) Applied aspects

2.b. Discuss the physiological mechanism of short-term and long-term regulation of arterial blood pressure. (15)

2.c.i. Explain the process of initiation of protein synthesis in eukaryotes. Enumerate any four inhibitors of protein synthesis with their mechanism of action. (6+4)

2.c.ii. Explain the principle and applications of Radioimmunoassay? (10)

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- 3.a.i. Discuss the functions of basal ganglia. Add a note on Parkinson's disease. (5+5-10)
- 3.a.ii. Discuss the mechanism of excitation-contraction coupling in the skeletal muscle. (10)
- 3.b. Explain the biochemical role of the different derivatives of vitamin A. Add a note on the causes, clinical manifestations and management of vitamin A deficiency. (15)
- 3.c.i. Describe the functional components, course, branches and applied aspects of the facial nerve. (10)
- 3.c.ii. Discuss the attachments and applied aspects of rotator cuff muscles of the shoulder joint. (5)
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#### **QUESTION 4**

- 4.a.i. Explain the mechanism of iron absorption in the intestine. What are the factors regulating the process? (15)
- 4.a.ii. Explain the diagnostic role of the thyroid function test (TFT) in the diagnosis of thyroid disorders. (5)
- 4.b.i. Draw a well-labelled diagram of stretch reflex. (5)
- 4.b.ii. What are the functions and clinical applications of stretch reflex? (10)
- 4.c.i. Discuss the lymphatic drainage of the mammary gland and its clinical significance. (5)
- 4.c.ii. Describe the development of the interventricular septum and write briefly about the congenital anomaly of the heart related to this structure. (10)
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#### **SECTION B (Pathology/Forensic Medicine/Pharmacology/Microbiology)**

#### **QUESTION 5**

- 5.a. Describe the molecular mechanisms of carcinogenesis of breast carcinoma. Describe the salient histopathological features of invasive carcinoma of no special type. (10)
- 5.b.i. Draw a diagram of IgA. What is its role in disease? (5)

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5.b.ii. What are opportunistic infections? Enumerate the various bacterial, parasitic, viral and fungal opportunistic infections seen in a case of AIDS. (5)

5.c. Discuss about angiotensin II receptor blocker (ARB). How are they different from angiotensin converting enzyme (ACE) inhibitors? Write the pharmacotherapy of hypertensive emergency. (10)

5.d. Define granulomatous inflammation. Describe in brief different types of granuloma. (10)

5.e. What is a firearm? What are the features of a firearm ammunition entry wound that will help in determining the range and direction of fire? (10)

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## QUESTION 6

6.a.i. Describe in brief the pathogenesis and histopathological features of rheumatic heart disease. (10)

6.a.ii. Enumerate two important causes of cirrhosis, Describe the key histopathological features of cirrhosis. (10)

6.b.State the therapeutic indications, drug interactions and side effects of the following drugs:

(i) Celecoxib (5)

(ii) Chloroquine (5)

6.c.i. What is Giardia lamblia? Write the manifestations of the disease produced by infection with Giardia and give its laboratory diagnosis. (10)

6.c.ii. What are the different dengue viruses? Give the pathogenesis of the infections by them. How is the laboratory diagnosis done in a case of dengue haemorrhagic fever? (10)

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## QUESTION 7

7.a. What are organophosphate compounds? Discuss briefly the clinical features, treatment and postmortem findings of a case of organophosphate poisoning. (15)

7.b.i. Enumerate four differentiating features between benign and malignant tumours. Describe in brief the pathogenesis of cancer cervix. (10)

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7.b.ii. Describe in brief the pathogenesis of type 1 diabetes mellitus. Enumerate two important glomerular lesions of diabetic nephropathy. (10)

7.c.i. Discuss the second-line drugs used for the treatment of tuberculosis. (10)

7.c.ii. Discuss the role of aldosterone antagonists as vasodilators. (5)

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## QUESTION 8

8.a.i. Enumerate different species of *Aspergillus* and the infections caused by them. Give the laboratory diagnosis of a case of pulmonary aspergillosis. (10)

8.a.ii. What is dysentery? Give the differences between bacterial and amoebic dysentery. Describe the laboratory diagnosis of a case of amoebic dysentery. (10)

8.b.i. What is drowning? Explain briefly the different types of drowning. (10)

8.b.ii. Draw a labelled diagram of the hyoid bone. Discuss briefly the various fractures of the hyoid bone. (10)

8.c.i. Elaborate the mechanism of action of Metformin. (5)

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

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## PAPER II

### SECTION A (General Medicine/Dermatology and Paediatrics)

#### QUESTION 1

1.a. Enumerate the imaging modalities used in the diagnosis of cardiac diseases. List their specific indications in diagnosing cardiac illnesses. (10)

1.b. Outline the pharmacological and non-pharmacological management of anxiety disorders. (10)

1.c. A 3-year-old girl, who weighs 12 kg, presents with history of loose stools mixed with blood and mucus and fever for 3 days. On examination, she is active and feeling excessively thirsty. There is some loss of skin turgor.

(i) Write your complete diagnosis. (2)

(ii) Name the most common micro-organism responsible for this condition. (2)

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(iii) Write two most important life-threatening complications of this condition. (2)

(iv) Outline the management of the condition in this girl. (4)

1.d.i. Give two examples for each of the following types of vaccines used in under-5 child. (6)

1. Capsular Polysaccharide Vaccines

2. Conjugate vaccines

3. Recombinant vaccines

1.d.ii. Define the following terms: (4)

1. Herd effect

2. Vaccine efficacy

1.e. (i) State the various modes of transmission of scabies. (4)

(ii) What is the mite burden in a classical case of scabies during (3)

1. an initial infection

2. in reinfection

3. in Norwegian scabies

(iii) Describe the distribution of cutaneous findings in scabies. (3)

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## Question 2

2.a. Discuss in brief the etiology, clinical features, diagnosis, and treatment of nephrotic syndrome in a 40-year-old adult. (20)

2.b. A 2-year-old unimmunized boy weighing 6 kg presented with fever, cough, and difficult breathing for 5 days. There was a history of fever with maculopapular rash lasting for 3 days around 7 days prior to this episode. The child is febrile and has a pulse rate of 116/min. respiratory rate: 72/min, Spo<sub>2</sub>, 88%. There is severe chest indrawing and nasal flaring. Auscultation revealed bronchial breath sounds on the left side and bilateral crepitations.

(i) State the complete diagnosis. (3)

(ii) Enumerate the 3 most important complications associated with this condition. (3)

(iii) How would you assess the severity of illness in this child (3)

(iv) Discuss in brief the management of this child. (6)

2.c. (i) What are the four 'P's used to describe the clinical manifestation of lichen planus? (5)

(ii) What are the common sites of cutaneous involvement in lichen planus? (5)

(iii) Describe Koebner phenomena. List the disorders where this phenomenon can be observed. (5)

### QUESTION 3

3. (a) (i) Discuss in brief about the diet and exercise-related advice given to a 35-year-old male diagnosed with non-insulin-dependent diabetes mellitus. (10)

3. (a) (ii) Write the acute complications of Insulin-dependent diabetes mellitus and outline their management. (10)

3.b. A 22-year-old primi mother comes to you with a complaint of "NOT ENOUGH MILK". Due to this, her baby remains hungry and is constantly biting at her nipples. She is feeling soreness in the nipples.

(i) How will you assess the mother-child duo to identify the underlying etiology of "NOT ENOUGH MILK"? Discuss briefly. (8)

(ii) Outline the 4 criteria each for "correct positioning" and "correct attachment" of the baby for proper breastfeeding. (4)

(iii) Discuss in brief the management of sore nipples. (3)

3. c. Following an acute episode of diarrhoea a 3 month old infant wearing diaper daily develops rash on skin surfaces that are in direct contact with diaper.

(i) What is your diagnosis? Describe clinical picture of this disorder. (10)

(ii) How do you treat skin condition of this child ? (5)

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### QUESTION 4

4.a. A 25-year-old female has presented to the medicine OPD with complaints excessive tiredness, cold intolerance, and menstrual irregularities.

(i) Write the name of the thyroid disorder that can lead to the above manifestations. (2)

(ii) Tabulate the, differentiating cardiovascular clinical manifestations in hypothyroidism and hyperthyroidism. (8)

(iii) Outline the pharmacological management of hypothyroidism and hyperthyroidism. What are the blood investigations conducted to monitor the treatment of hypothyroidism and hyperthyroidism? (10)

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4.b. A 6-week old sick looking young infant is brought to a primary health center with suspicion of "Possible Bacterial Infection" as per Integrated Management of Neonatal and Childhood Illness (IMNCI) strategy:

(i) How will you assess this child, and classify as having a "Possible Serious Bacterial Infection" or "Local Bacterial Infection"? (10)

(ii) State the treatments for Possible Serious Bacterial Infection" and "Local Bacterial Infection" as per IMNCI strategy. (10)

4.c. A young epileptic patient was put on antiseizure drug Lamotrigine. Three weeks later he develops an eruption consisting of purpuric macules and bullae all over skin with involvement of lips, oral mucous membrane and eyes. Skin was tender to touch.

(i) What is the differential diagnosis in this case? (5)

(ii) How will you manage this condition? (5)

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## QUESTION 5

5.a. (i) Name the clinical tests for checking saphenofemoral junction competence and deep venous system patency. (2)

(ii) Enumerate the complications of varicose veins (4)

(iii) Briefly discuss the management of venous ulcer. (4)

5.b. A 65 year old male came to a casualty with acute retention of urine. He also gave history of nocturia, urgency, dribbling and thin stream of urine for two years.

(i) How will you manage acute retention of urine in this patient ? (4)

(ii) Briefly outline the definitive management in this patient. (6)

5.c. Outline the management of a 35 year old multigravida patient who has presented to the emergency department in a state of shock. She has delivered a dead baby at home 2 hours back and the placenta has not delivered. She has a previous history of lower segment caesarean section. (10)

5.d. (i) Enumerate the contraindications which limit the usage of oral contraceptive pills in a woman.

(ii) Discuss the causes for failure of sterilization procedure in males and in females (5+5=10)

5.e. State the National Guidelines on the feeding of infant and young child. What are the goals which these guidelines strive to achieve? (10)

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### QUESTION 6

6.a. Define 'pre-eclampsia. Enumerate the risk factors which may lead to this condition. What are its clinical signs and what are its alarming symptoms? Outline in brief its management." (3+5+6+6-20)

6. (b) Describe clinical features, diagnosis and management of ileo-caecal tuberculosis. (5+5+5=15)

6. (c) (i) What are the objectives of investigating an epidemic ? (5)

6. (c) (ii) Briefly state the various steps you would undertake while investigating an epidemic? (10)

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### QUESTION 7

7.a. A 40 year old lady came to casualty with pain in the right upper abdomen associated with vomitings for 5 days. On examination, she was found to be having tenderness in right hypochondrium; the rest of the abdomen was normal. Ultrasound abdomen revealed a thick walled gallbladder with gall stones and pericholecystic fluid.

(i) What is the clinical diagnosis and how will you manage this condition? (6)

(ii) Enumerate the complications of gall stones. (6)

(iii) What is Mirizzi Syndrome? How would you investigate and manage it ? (8)

7. b. (i) What is the total content of iron in the human body ? (2)

(ii) What are its bodily functions? (4)

(iii) State the interventions being undertaken under the Anaemia Mukht Bharat Strategy. (9)

7.c. (i) What is the current consensus on prescribing Hormone replacement therapy (HRT) in post menopausal women?

7.c. (ii) Discuss its merits and demerits. (10+5=15)



## QUESTION 8

8.a. The 'End TB Strategy' is an evolution over the previous strategies to win over tuberculosis.

- (i) What are the key principles of the End TB Strategy ? (4)
- (ii) What are the pillars and components of this strategy? (10)
- (iii) What are the major barriers that have thwarted the progress in the battle against the disease ? (6)

8.b. (i) What has been the impact of HPV vaccination in India? (7.5)

8.b. (ii) Discuss the currently available Human Papilloma Virus (HPV) Vaccines and their schedules. (7.5)

8.c. A 60 year old lady comes to surgery OPD with 6x4 cm lump in her right breast with nipple discharge.

- (i) What will be the possible findings on clinical examination if this lump were to be malignant ? (6)
  - (ii) How will you investigate this patient ? (6)
  - (ii) What are the important structures which are to be preserved during modified radical mastectomy (3)
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