

**UPSC CSE  
MEDICAL SCIENCES OPTIONAL  
FINAL PAPER 2024**



## Paper I

### Section A

1.(a) Describe the radial nerve under the following headings :

(i) Origin and course

(i) Branches and muscles supplied

(iii) Applied aspects (10)

1.(b) Describe the development of ventricles of the heart. Add a note on Fallot's tetralogy. (10)

1.(c) Explain the 'Mucosal Block Theory' for iron absorption. Discuss briefly the complications of excess of iron deposition in the body. (10)

1.(d) Give the sequence of events at the neuromuscular junction during the transmission of a nerve impulse. Name the muscles most commonly affected by myasthenia gravis. (10)

1.(e) Describe the components of the nervous system which are concerned with 'conscious alert state' that makes perception possible. (10)

2.(a) A middle-aged female notices a lump in the midline of the neck. She notices it moves with swallowing. The surgeon gives a tentative diagnosis of goitre.

Describe the thyroid gland under the following headings :

(i) Gross anatomy and relations

(ii) Blood supply and lymphatic drainage

(iii) Surgical anatomy of thyroid gland (5+5+5=15)

2.(b) Explain why vitamin D can be considered to be a hormone'. Describe the role of vitamin D in calcium homeostasis. (10)

2.(c) Discuss the sources and Recommended Daily Allowance (RDA) of vitamin B12. Briefly discuss the absorption of vitamin B12 in the GIT and the clinical manifestations of the disorder of absorption of vitamin B12. (10)

2.(d) Define the Frank-Starling law. State the significance and causes of shift of Frank-Starling curve to right and left. (10)

2.(e) What is the role of baroreceptors and chemoreceptors in the regulation of blood pressure? (5)

3.(a) Describe the uterus under the following headings :

(i) Gross anatomy

(ii) Ligaments and supports

(iii) Relations of uterus

(iv) Blood supply

(v) Lymphatic drainage

(vi) Applied aspects (20)

3.(b) ii. Which antibiotics and toxins inhibit protein synthesis in prokaryotes and eukaryotes? Briefly explain the mechanism of action of each of them. (10)

3.(b) iii. What are ribozymes? Explain briefly the role of any one ribozyme in protein synthesis. (5)

3.(c) i. Enumerate the major hormonal causes of dwarfism. Give their characteristic features. (10)

3.(c) ii. Describe the principal events during oogenesis in brief. (5)

4. (a) (i) Describe the facial nerve under the following headings :
  1. Functional columns and nuclei of origin
  2. Course and branches
  3. Bell's palsy (4+4+2=10)
- 4.(a) (ii) Differentiate between indirect and direct inguinal hernia (5)
4. (b) (i) Define renal clearance. What key features should be present in a compound for it to be considered as a 'gold standard' for measurement of renal clearance? Explain why urea is not considered as a 'gold standard' for this. (10)
4. (b) (ii) Briefly describe the role of Restriction Fragment Length Polymorphism (RFLP) in DNA fingerprinting (10)
4. (c) (i) Give the physiological basis of anaemia in kidney and liver disease. (5)
4. (c) (ii) Describe the role of eosinophils in control of allergy reactions. (5)
4. (c) (iii) Describe the role of platelets in haemostasis. (5)

## **Paper I**

### **Section B**

5. (a) (i) Discuss the antiviral spectrum and therapeutic uses of acyclovir. (5)
  5. (a) (ii) Doxorubicin is an antibiotic. Enumerate its role in cancer chemotherapy and its adverse effects. (5)
  5. (b) What is hypersensitivity? Enumerate different hypersensitivity reactions along with examples. Define type I hypersensitivity reaction and write its role in health and disease. (10)
  5. (c) Define cancer. Describe in detail the effects of cancer-related genes on cell growth. (2+8=10)
  5. (d) A 50-year-old male presented with a history of chest pain, polyuria and polydipsia since last 5 years. Investigations showed HbA1c level of 12%, cardiac enzymes were normal, while urinalysis showed proteinuria.
    - (i) What is the most likely diagnosis?
    - (ii) Describe the microscopic findings.
    - (iii) What is the pathogenesis? (2+4+4=10)
  5. (e) Define injury. Discuss the microscopic and histochemical methods which can determine the age of injury. (10)
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6. (a) (i) Describe the microscopic features of breast cancer. Enumerate any five major prognostic factors. (5+5=10)
  6. (a) (ii) Enumerate any five differences between primary tuberculosis and secondary tuberculosis. (10)
  6. (b) (i) Explain why primaquine is used for radical cure of malaria. (5)
  6. (b) (ii) Explain why albendazole is termed as broad-spectrum oral anthelmintic. (5)
  6. (c) (i) What is candidiasis? What are its different presentations and etiological causes? Give the laboratory diagnosis of a case of invasive candidiasis. (2+4+4=10)
  6. (c) (ii) What is shigellosis? What are its causative organisms and their modes of pathogenicity? Give the laboratory diagnosis of a case. (2+4+4=10)

7. (a) (i) Define death due to hanging. What are the probable causes of death in hanging? (10)
  7. (a) (ii) What are the findings in a case of judicial hanging? (5)
  7. (b) (i) A 55-year-old female presented with hamatemesis. On physical examination, she was afebrile and pale. No organomegaly was noted. Serological tests for hepatitis B were positive.
    1. What is the most likely diagnosis?
    2. Describe the microscopic findings.
    3. What is the pathogenesis? (2+4+4=10)
  7. (b) (ii) Describe the clinical features and microscopic findings in acute lymphoblastic leukaemia. (5+5=10)
  7. (c) (i) State the role of diuretics in the management of hypertension. (5)
  7. (c) (ii) Discuss how excess dose of paracetamol causes acute hepatocellular toxicity and how you will manage the condition. (5)
  7. (c) (iii) Elaborate the advantages and disadvantages of Sodium-Glucose Cotransporter-2 (SGLT-2) inhibitors in the management of diabetes mellitus. (5)
8. (a) (i) What is enteric fever? What are its causative agents? Give a detailed presentation of a case according to the time of the disease and the respective tests used for diagnosis. (2+2+3+3=10)
  8. (a) (ii) Draw a diagram of HIV virion depicting the various antigens and proteins. Give the serological pattern in an HIV infection according to the time of presentation. List the various diseases associated with AIDS. (4+4+2=10)
  8. (b) (i) What is virtual autopsy? State its methodology. What are its merits? (10)
  8. (b) (ii) Define brain death. Describe its medicolegal importance. (10)
  8. (c) (i) Discuss why infliximab is considered as an immunosuppressant. Mention its therapeutic uses. (5)
  8. (c) (ii) Describe briefly the pharmacological characteristics of natriuretic peptides and their clinical uses. (5)

## Paper II

### Section A

1. (a) Discuss in short the role of a Chest X-ray in the diagnosis of pulmonary tuberculosis. (10)
1. (b) Describe the clinical features for diagnosing a case of Depression. (10)
1. (c) What are the key differences between Kwashiorkor and Marasmus?  
Which is the easiest method which can help in the early detection of Protein Energy Malnutrition (PEM) in children? (10)
1. (d) During the initial phase of stabilization in a severe acute malnourished child, map out the dietary plan. State the type, amount and frequency of feed that the child requires and for how long that would be necessary. In this phase, what is the vitamin and mineral supplementation given? (10)
1. (e) In a confirmed case of scabies in an adult :
  - (i) What are the primary manifestations of the disease and what is the pattern of distribution of lesions on the body ?
  - (i) What are the complications seen in scabies? (5+5=10)
2. (a) (i) Discuss in short about the different modalities used in the diagnosis of Extra-Pulmonary Tuberculosis. (10)
2. (a) (ii) Describe the clinical features of malabsorption syndrome. (10)
2. (b) (i) Write in brief the ten steps of Baby-friendly Hospital Initiative (revised 2018). (10)
2. (b) (ii) Write the advantages of breast-feeding. (10)



2. (c) A young adult female develops asymptomatic depigmented chalky white macules and patches with no sign of inflammation over face and around body orifices.
- (i) What is the diagnosis ?
  - (i) What are the associated findings seen in this disorder ?
  - (iii) How is this disorder classified ?
  - (iv) Describe the clinical course of the disease. (3+4+4+4=15)
3. (a) Describe the clinical features, diagnosis and treatment of Kala-azar. (20)
3. (b) What are the types of vaccines currently in use against Pneumococcus organisms? State the National Immunization Schedule for administering Pneumococcal Vaccine in infants. Enumerate the diseases that the Pneumococcal Vaccine can safeguard against. (15)
3. (c) A young female patient develops acute inflammatory papules and vesicles all over her scalp and tips of ears following repeated use of hair dye.
- (i) What is the diagnosis?
  - (i) How can the diagnosis be confirmed ?
  - (iii) How will this condition be treated ? (5+5+5=15)
4. (a) A sixty-year-old male develops central chest pain while walking uphill. The pain is squeezing in character, radiating to left arm, that relieves on taking rest. Discuss in short about the evaluation and treatment of this case. (20)
4. (b) (i) Enumerate the causes of respiratory distress in a newborn. How would you differentiate between respiratory distress of respiratory origin and that of cardiac origin? (8)
- 4.b. (ii) Write the complications of cyanotic congenital heart diseases. (4)
- 4.b. (iii) How will you manage a one-year five-month old child presenting with severe respiratory distress with a history of cough and fever for 5 days? (8)
4. (c) (i) What is the meaning of the term lichenoid' ? (ii) Name the disease that is a prototype of lichenoid reaction. (iii) Describe the clinical features of the disease. (3+3+4=10)

## **Paper II**

### **Section B**

- 5.a.(i) Enlist conditions having an increased risk of malignant disease in bone and cartilage.
- 5.a.(ii) Briefly mention classification of bone tumours. (5+5=10)
5. (b) A 55-year-old male patient underwent subtotal gastrectomy for carcinoma stomach. Briefly describe early and late complications of this procedure. (10)
- 5.c.(i) A 25-year-old infertile woman presents with menorrhagia. USG (Ultrasound) pelvis revealed multi-fibroid uterus, largest measuring 3 x 3 cm. Describe the evaluation and management of Fibroid Uterus in the above patient.
- 5.c.(ii) Describe recent classification of Abnormal Uterine Bleeding (AUB). Briefly discuss the endometrial pattern in various types of Abnormal Uterine Bleeding. (5+5=10)
5. d. (i) A young newly married couple wants advice on contraception. Describe the various methods of contraception which are suitable for them. (5)
5. d. (ii) Enlist the various methods of female sterilization and complications of tubectomy. (5)
5. (e) (i) Describe the 'yellow' category of biomedical waste in terms of types of waste, types of bags or containers to be used, and treatment and disposal options.
5. (e) (ii) Comment upon 'incineration' as a method of biomedical waste management. (5+5=10)

6. a. (i) A 22-year-old Unbooked Primigravida at 38 weeks of gestation presents to Emergency with labour pains. How would you evaluate the patient for obstetric triaging and further management of labour ?

6. a. (ii) Discuss the clinical features, diagnosis and management of Rupture Uterus following obstructed labour. (10+10=20)

6. b. (i) Write the clinical features and diagnostic work-up in a case of carcinoma rectum. (5)

6. b. (ii) Briefly mention Dukes' staging for this condition. (5)

6. b. (iii) Enumerate surgical options for this disease. (5)

6. (c) In the context of HIV/AIDS control and the National AIDS Control Programme in India, comment upon the following:

(i) 95-95-95 targets (3)

(ii) Categorization of districts (4)

(ii) TB-HIV coordination to reduce mortality (8)

7 (a) A 50-year-old male presented with a 3 cm nodule in the left lobe of thyroid gland with a hard left cervical lymph node. Fine Needle Aspiration Cytology (FNAC) from the thyroid nodule revealed orphan Annie-eyed nuclei.

(i) What is the diagnosis in this case? How can this condition be managed surgically ?

(ii) Enumerate different prognostic scoring systems for this condition.

(iii) What are the post-operative complications of total thyroidectomy ?

(8+5+7=20)

7 (b) (i) List the various sources of health information. (5)

7 (b) (ii) Describe the limitations of hospital records as a source of health information. (5)

7 (b) (iii) Write in brief the use of pictograms for presenting health information data. (5)

7.c. (i) What are the signs and symptoms of Pelvic Inflammatory Disease (PID) ?

(ii) What are the complications of PID?

(iii) How do you manage a 28-year-old woman, P1L1 with unilateral Tubo-ovarian abscess ?

(5+5+5=15)

8. (a) (i) What are the different types of epidemiological studies? (ii) What are the possible sources of control in case-control studies? (iii) List the advantages of case-control studies as compared to cohort studies. (6+6+8=20)

8.b. Define Antenatal Care. What are its objectives? What is the schedule of antenatal clinic visits that a mother is expected to follow during the course of her pregnancy? What are the advantages and disadvantages of domiciliary midwifery service? (15)

8.c.(i) Enumerate causes of hematuria in a 60-year-old male (5)

8.c.(ii) Briefly describe the management of carcinoma prostate in a 60 year old male (10)

### **BRIEF ANALYSIS**

100% within syllabus

640 out of 800 (80% repeats #PYT)

160 out of 800 (20% non-repeats (# Unasked))

Repeats from Previous year papers (Direct/Indirect)

- 3 topics from 2023 paper
- 14 topics from 2022 paper
- 14 topics from 2021 paper
- 9 topics from 2020 paper
- 13 topics from 2019 paper

### **UNAKSED TOPICS LIST**

- 1) Natriuretic peptides
- 2) Effects of cancer-related genes on cell growth
- 3) ALL
- 4) Virtual autopsy
- 5) Brain death
- 6) Kwashiorker and Marasmus**
- 7) Kala Azar**
- 8) Lichenoid reaction
- 9) Bone tumors**
- 10) Hospital waste management**
- 11) Management of Labour**
- 12) HIS : Pictograms
- 13) PID
- 14) Domociliary Midwifery Service

75 marks out of 160 covered as part of course (~10%) : TOPICS IN BOLD covered in upsc medico courses

***~ 90% strike rate from the course***

Best questions to choose

Paper 1: 1 3 4 5 6

Paper 2: 1 2 5 6 8



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