

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

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

1. INTRODUCTION TO ONCOLOGY

- Principles of oncology
- Cell proliferation, differentiation, cell cycle
- Hallmarks of cancer
- Cancer genome- Oncogenes, tumor suppressor genes
- Tumor angiogenesis and microenvironment
- Invasion and metastases
- Tumor Immunity
- Molecular Methods in Oncology-Applications, Specimen requirements, Testing Process, Technologies

2. CANCER EPIDEMIOLOGY

A. ETIOLOGY OF CANCERS

- Tobacco
- Oncogenic viruses
- Inflammation
- Chemical agents
- Physical agents
- Nutritional factors and obesity /Physical Activity

B. EPIDEMIOLOGY OF CANCER

- Basic epidemiological methods – Trends in Cancer mortality
- Cancer screening methods and recommendations
- Cancer registries and databases
- Cancer prevention
- National and international cancer programmes

3. CANCER GENETICS

- Diagnostic methods in cancer genetics
- Genetic counselling

4. BIostatistics & CLINICAL TRIALS

- Basics of biomedical statistics
- Data collection and organization
- Survival analysis

- Clinical trial design and conduct of clinical trials
- Quality of life assessment
- Phase 1 trials
- Phase 2 trials
- Phase 3 trials
- Meta analysis

5. CANCER THERAPEUTICS

A. RADIATION ONCOLOGY

- Biologic Aspects of Radiation Oncology
- Factors that Affect Radiation Response
- Drugs that Affect Radiation Sensitivity
- Radiation Physics
- Treatment Planning techniques
- Other Treatment Modalities
- Clinical Applications of Radiation Therapy
- Treatment dosing strategies
- Fractionation biology and applications
- Adverse Effects
- Principles of Combining Anticancer Agents with Radiation Therapy
- Latest advances

B. SURGICAL ONCOLOGY

- Principle of surgery
- Surgical techniques
- Role of surgery in cancer prevention
- Laparoscopic oncological surgery
- Robotic surgery advances

C. PRINCIPLES OF CHEMOTHERAPY

- Cell cycle and kinetics
- Pharmacokinetics
- Pharmacodynamics
- Pharmacogenomics
- Alkylating agents
- Platinum analogs
- Antimetabolites
- Topoisomerase inhibitors
- Antitubule agents
- Hypomethylating and Histone deacetylating agents
- Proteasome Inhibitors
- PARP inhibitors

- Miscellaneous agents
- Hormonal agents
- Anti-angiogenesis agents
- Kinase Inhibition
- Monoclonal antibodies
- Assessment of Clinical response

D. RESPONSE ASSESSMENT IN CANCER THERAPY

E. CANCER IMMUNOTHERAPY

- Principles of tumor immunity
- Tumor antigens
- Immune evading mechanisms
- Immune tolerance
- Immune diagnostics
- Check point inhibitors
- Cancer vaccines
- Response assessment in immunotherapies
- Adverse effects and management
- Clinical trial end points in immunotherapy
- Future trends
- Dendritic cells
- CDRT Cells and Other Cellular Therapies

F. CONCEPTS OF METRONOMIC CHEMOTHERAPY

G. IMAGING IN CANCERS

H. DIAGNOSTIC PATHOLOGY IN ONCOLOGY

- Histological techniques
- Immunohistochemistry
- Cytology
- Circulating tumor cells
- Molecular pathology techniques -PCR, NGS, WGS
- Cytogenetics
- Flow cytometry
- Clinicopathological correlation

I. VASCULAR ACCESS IN CANCER PATIENTS

J. BIOMARKERS IN ONCOLOGY

K. TISSUE CULTURE AND TISSUE BANKING

L. CANCER BIOINFORMATICS

M. INFORMATION TECHNOLOGY AND ARTIFICIAL INTELLIGENCE

6. SYSTEMIC ONCOLOGY

A. NEOPLASMS OF HEAD AND NECK

- Molecular biology of head neck cancers
- Cancer of head and neck
- Rehabilitation of a patient with head neck cancer

B. NEOPLASMS OF THORACIC CAVITY

- Molecular biology of lung cancer
- Non-small cell lung cancer
- Small cell lung cancer
- Neoplasms of mediastinum

C. NEOPLASMS OF GASTROINTESTINAL TRACT

- Molecular biology of Esophageal and gastric cancers
- Esophageal cancer
- Gastric cancer
- Molecular biology of pancreatic cancer
- Pancreatic cancer
- Genetic testing in gastric and pancreatic cancers
- Molecular biology of liver cancer
- Liver and biliary cancers
- GIST
- Molecular biology of colorectal cancer
- Genetic testing in colon cancer
- Cancer colon
- Cancer rectum
- Cancer anal region

D. NEOPLASMS OF GENITOURINARY TRACT

- Molecular biology of Kidney cancer
- Cancer of the Kidney
- Cancer of bladder
- Molecular biology of prostate cancer
- Cancer of the prostate
- Cancer of testis

E. GYNAECOLOGICAL NEOPLASMS

- Molecular biology of Gynaecological malignancies
- Cancer cervix, vagina, vulva
- Cancer of uterine body
- Cancer of the ovary
- Gestational trophoblastic neoplasia

F. NEOPLASMS OF THE BREAST

- Molecular biology of breast cancer
- Breast cancer
- Genetic testing of breast cancer

G. NEOPLASMS OF THE ENDOCRINE SYSTEM

- Molecular biology of endocrine cancers
- Genetic testing in endocrine cancers
- Thyroid tumors
- Parathyroid tumors
- Adrenal tumors
- Pancreatic neuroendocrine tumors
- Carcinoid tumors
- Multiple endocrine neoplasia

H. BONE AND SOFT TISSUE NEOPLASMS

- Molecular biology of sarcomas
- Soft tissue sarcoma
- Bone tumors

I. SKIN TUMORS

- Cancer of the skin
- Molecular biology of melanoma
- Malignant melanoma

J. NEURO-ONCOLOGY

- Molecular biology of CNS tumors
- Tumors of CNS

K. HEMATOLYMPHOID CANCERS

- Molecular biology of acute leukemias
- Molecular biology of lymphomas
- Acute leukemias
- Management of acute leukemias
- Non-Hodgkin lymphoma
- Hodgkins lymphoma
- Plasma cell neoplasms
- Chronic leukemias
- Myelodysplastic syndromes
- Myeloproliferative neoplasms

L. HAEMATOPOIETIC STEM CELL TRANSPLANTATION

- Autologous transplantation
- Allogeneic transplantation
- Complications of HSCT
- Haplo Transplant
- Transplant/Registry

M. CELLULAR THERAPIES FOR CANCER MANAGEMENT

- CAR-T cell therapy
- NK-T cell therapy
- Cytotoxic T cell therapies
- Mesenchymal stromal cell therapies

N. CANCER OF UNKNOWN PRIMARY SITE

O. MESOTHELIOMA

P. TRANSFUSION MEDICINE IN ONCOLOGY

Q. IMMUNO SUPPRESSION RELATED MALIGNANCIES

- HIV associated cancers
- Transplantation related cancers

7. ONCOLOGICAL EMERGENCIES

- Superior vena cava syndrome
- Raised intracranial tension
- Tumor lysis syndrome
- Spinal cord compression
- Metabolic emergencies

8. MANAGEMENT OF A PATIENT WITH METASTATIC CANCER

- Liver metastases
- Lung metastases
- Brain metastases
- Bone metastases
- Malignant ascites
- Pleural and pericardial effusions
- Paraneoplastic syndromes

9. MANAGEMENT OF ADVERSE EFFECTS ON ANTICANCER THERAPY

- Infections in cancer patients
- Neutropenia and thrombocytopenia
- Anemia in a cancer patient
- Cancer associated thrombosis
- Nausea and vomiting
- Hair and skin complications
- Oral complications
- Neurological complications
- Cardiac toxicity
- Pulmonary toxicity
- Gonadal dysfunction
- Cancer fatigue
- Neurocognitive dysfunction
- Bowel complications

10. SECOND MALIGNANCIES

11. GERIATRIC ONCOLOGY

12. CANCER SURVIVORSHIP

13. CHILDHOOD CANCERS

- Molecular biology of childhood cancers
- Solid tumors in childhood
- Hematological malignancies in childhood
- Late adverse effects of cancer therapies

14. CANCER PAIN MANAGEMENT

15. PALLIATIVE CARE

16. NUTRITIONAL SUPPORT IN CANCER PATIENTS

17. SEXUAL PROBLEMS IN CANCER PATIENTS

18. COMMUNICATION WITH CANCER PATIENTS

19. END OF LIFE CARE

20. REHABILITATION OF CANCER PATIENTS

21. ALTERNATIVE AND COMPLEMENTARY MEDICINES IN CANCER

22. MEDICOLEGAL ASPECTS OF CANCER CARE

* * * * *

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.)