

भारतीय प्रौद्योगिकी संस्थान रुड़की  
**Indian Institute of Technology Roorkee**

**RECRUITMENT EXAMINATION FOR**  
**JUNIOR TECHNICAL SUPERINTENDENT (PATHOLOGY)**

**TIER-I**

**This booklet consists of 16 pages.**

इस पुस्तिका में १६ पृष्ठ शामिल हैं।

**Maximum Marks: 50**

अधिकतम अंक: ५०

**Time: 120 Minutes**

समय: १२० मिनट

**Name of Candidate (CAPITAL LETTERS):** \_\_\_\_\_

अभ्यर्थी का नाम

**Roll Number:** \_\_\_\_\_

अनुक्रमांक संख्या

**Father's Name:** \_\_\_\_\_

पिता का नाम

**Date of Examination:** \_\_\_\_\_

परीक्षा की तिथि

\_\_\_\_\_  
**Signature of Candidate**

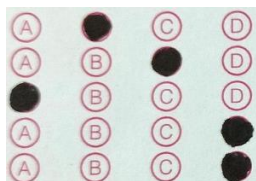
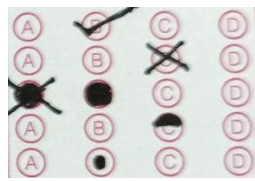
अभ्यर्थी के हस्ताक्षर

\_\_\_\_\_  
**Signature of Invigilator**

निरीक्षक के हस्ताक्षर

## INSTRUCTIONS TO CANDIDATES

1. This question paper has 50 questions. Each question carries one mark. There are four choices for answer (A, B, C, D) to each question. Choose the correct answer (one only) for each question and mark it on the Optical Response Sheet (**ORS**).
2. Read the instructions given in the ORS carefully.
3. Use a black pen only otherwise, ORS will not be evaluated.
4. Candidate must write Name, Roll No., Date of Examination, Booklet Code and sign on the ORS.
5. The candidate should check that the booklet does not have any unprinted or torn or missing pages or questions etc. If so, get it replaced with another question paper.
6. While marking your answer on the ORS, fully darken the circle. Answer once marked cannot be changed.
7. One (1) mark will be awarded for each correct answer and minus one by three ( $-\frac{1}{3}$ ) mark for each incorrect answer. The unanswered questions will not attract negative marks.
8. Return the ORS to the invigilator after the examination is over.
9. Candidate is allowed to take away question paper after the examination.
10. Mobile and other Electronic Gadgets are prohibited in the examination. Watches of any kind are also not allowed.
11. Use of unfair means in examination will lead to cancellation of candidature.

CORRECT Method of Answering in ORS ORS में उत्तर देने का सही तरीका	WRONG Method of Answering in ORS ORS में उत्तर देने का गलत तरीका
	

## उम्मीदवारों के लिए अनुदेश

1. इस प्रश्नपत्र में 50 प्रश्न हैं। प्रत्येक प्रश्न के उत्तर के लिए चार (A, B, C, D) विकल्प हैं। प्रत्येक प्रश्नके लिए सही उत्तर (केवल एक) चुनें और उसे Optical Response Sheet (ORS) शीट पर चिह्नित करें।
2. ORS में दिए गए निर्देशों को ध्यान से पढ़ें।
3. केवल काले पेन का प्रयोग करें, अन्यथा ORS का मूल्यांकन नहीं किया जाएगा।
4. ORS शीट पर अपना नाम, रोल नंबर, परीक्षा की तिथि, पुस्तिका कोड लिखें और हस्ताक्षर करें।
5. उम्मीदवार को यह जांचना चाहिए कि इस पुस्तिका में कोई अमुद्रित या फटे या लापता पृष्ठ या प्रश्न आदि नहीं हैं। यदि ऐसा है, तो इसे एक नये प्रश्न पत्र से बदल लें।
6. ORS पर अपना उत्तर अंकित करते समय उस गोले को पूरी तरह से काला कर दें। एक बार अंकित उत्तर को बदला नहीं जा सकता।
7. प्रत्येक सही उत्तर के लिए एक (1) अंक प्राप्त होगा और प्रत्येक गलत उत्तर के लिए एक बटा तीन ( $-\frac{1}{3}$ ) अंक घटा दिया जाएगा। अनुत्तरित प्रश्न नकारात्मक अंक आकर्षित नहीं करेंगे।
8. परीक्षा समाप्त होने के बाद ORS निरीक्षक को लौटा दें।
9. उम्मीदवार को परीक्षा के बाद प्रश्न पत्र अपने साथ ले जाने की अनुमति है।
10. परीक्षा में **मोबाइल** और अन्य **इलेक्ट्रॉनिक गैजेट्स** वर्जित हैं। किसी भी प्रकार की घड़ियों की भी अनुमति नहीं है।
11. परीक्षा में अनुचित साधनों के प्रयोग की स्थिति में उम्मीदवारी रद्द कर दी जाएगी।

**(Objective type questions)**

(वस्तुनिष्ठ प्रकार के प्रश्न)

**Each question carries 1 mark**

प्रत्येक प्रश्न के 1 अंक है

Note: Read the passage below and answer question numbers 1 & 2.

The chief condition of happiness, barring certain physical prerequisites, is the life of reason, the specific glory and power of man. Virtue, or rather excellence will depend on clear judgment, self-control, symmetry of desire, artistry of means; it is not the possession of the simple man, nor the gift of innocent intent, but the achievement of experience in the fully developed man. Yet there is a road to it, a guide to excellence, which may save many detours and delays: it is the middle way, the golden mean. The qualities of character can be arranged in triads in each of which the first and the last qualities will be extremes and vices, and the middle quality, a virtue or an excellence. So, between cowardice and rashness is courage; between stinginess and extravagance is liberality; between sloth and greed is ambition; between humility and pride is modesty; between secrecy and loquacity is honesty; between quarrelsomeness and flattery is friendship; between Hamlet's indecisiveness and Don Quixote's impulsiveness is self-control. The right in ethics or conduct is not different from right in mathematics or engineering; it means correct, fit, what works best to the best results.

1. What is the main idea of the passage?
  - A. The qualities of character are three-extremes and middle.
  - B. In some respects, ethics and mathematics resemble.
  - C. Happiness can be achieved by following the middle path.
  - D. None of the above
  
2. What the passage emphatically suggests?
  - A. Happiness depends upon physical qualities.
  - B. Self-control is necessary.
  - C. Physical qualities ensure excellence in all walks of life.
  - D. Rational approach lies in following the extreme paths.
  
3. Smallpox has been eradicated \_\_\_\_\_ India.
  - A. in
  - B. from
  - C. within
  - D. to

4. \_\_\_\_\_ mother was still alive in her.
- A. The
  - B. A
  - C. An
  - D. Little
5. I, who \_\_\_\_\_ your king, will lead you.
- A. is
  - B. are
  - C. am
  - D. were
6. The difference between a two-digit number and the number obtained by interchanging the positions of its digits is 36. What is the difference between the two digits of that number?
- A. 3
  - B. 4
  - C. 9
  - D. 7
7. The pair of equations  $x = a$  and  $y = b$  graphically represents lines which are \_\_\_\_\_
- A. parallel
  - B. intersecting at  $(b, a)$
  - C. coincident
  - D. intersecting at  $(a, b)$

8. A sum of Rs. 25000 will become Rs. 32000 in 48 months at some rate of the simple interest. Which of the following will of the correct rate of interest per annum?
- A. 6%
  - B. 10%
  - C. 7%
  - D. 12%
9. The ratio of the number of boys and girls in a college is 7:8. If the percentage increase in the number of boys and girls be 40% and 30% respectively, what will be the new ratio of the boys and girls?
- A. 49:52
  - B. 17:18
  - C. 21:22
  - D. 1:1
10. Given that set  $A = \{2, 3, 4, 5\}$  and set  $B = \{11, 12, 13, 14, 15\}$ . Two numbers are randomly selected, one from each set. What is the probability that the sum of the two numbers equal 16?
- A. 0.2
  - B. 0.25
  - C. 0.3
  - D. 0.33
11. Which institution set up a committee to prepare roadmap to introduce undergraduate and postgraduate courses in regional languages?
- A. AICTE
  - B. UGC
  - C. NITI Aayog
  - D. NCERT

12. The ideals of liberty, equality and fraternity in the Constitution of India are borrowed from the Constitution of which country?
- A. France
  - B. Australia
  - C. England
  - D. Russia
13. Which space agency helps India in tracking the solar mission Aditya-L1?
- A. NASA
  - B. ESA
  - C. JAXA
  - D. ROCOSMOS
14. Where is the headquarter of the International Cricket Council?
- A. London
  - B. Melbourne
  - C. Cape Town
  - D. Dubai
15. What is India's rank in steel production in the world?
- A. 1
  - B. 2
  - C. 4
  - D. 5

16. What is the short cut key for a manual line break in MS-Word?
- A. Ctrl+Enter
  - B. Alt+Enter
  - C. Shift+Enter
  - D. Space+Enter
17. Which of the following function key is used for doing the spelling check in MS-Word document?
- A. F2
  - B. F4
  - C. F7
  - D. F9
18. Which of the following is an e-mail client?
- A. Outlook
  - B. Internet Explorer
  - C. Netscape
  - D. RAM
19. Which of the following protocol can only be used for sending emails?
- A. IMAP
  - B. POP3
  - C. SMTP
  - D. HTTP

20. The command which is used in the Microsoft window operating system to permanently delete the file without sending it to the recycle bin is \_\_\_\_\_
- A. Ctrl + Delete
  - B. Shift + Delete
  - C. Alt + Shift + Delete
  - D. Delete
21. Tuberculosis is a type of \_\_\_\_\_
- A. Type I hypersensitivity reaction
  - B. Type II hypersensitivity reaction
  - C. Type IV hypersensitivity reaction
  - D. Type III hypersensitivity reaction
22. Which pigment is also known as “wear and tear pigment”?
- A. Hemosiderin
  - B. Lipofuscin
  - C. Anthracotic
  - D. Biliverdin
23. Which of the following terms literally mean “hardening of the arteries”?
- A. Atherosclerosis
  - B. Arteriosclerosis
  - C. Aneurysm
  - D. Arteritis



24. Spherocytes in peripheral smear are seen in \_\_\_\_\_
- A. Hereditary spherocytosis
  - B. Warm autoimmune hemolytic anemia
  - C. Cold autoimmune hemolytic anemia
  - D. All of the above
25. Edema is caused by \_\_\_\_\_
- A. increased hydrostatic pressure and increased plasma osmotic pressure
  - B. decreased hydrostatic pressure and decreased plasma osmotic pressure
  - C. increased hydrostatic pressure and decreased plasma osmotic pressure
  - D. decreased hydrostatic pressure and increased plasma osmotic pressure
26. Hyperplasia refers to \_\_\_\_\_
- A. Increase in cell number
  - B. Nuclear enlargement
  - C. Increase in cell size
  - D. Nuclear hyperchromasia
27. All of the following are endogenous pigments except \_\_\_\_\_
- A. Lipofuscin
  - B. Melanin
  - C. Hemosiderin
  - D. Anthracotic pigment

28. Necrosis which is most often encountered in tuberculosis, is \_\_\_\_\_
- A. Caseous necrosis
  - B. Gangrenous necrosis
  - C. Fibrinoid necrosis
  - D. Fat necrosis
29. Necrotizing granulomas are seen in \_\_\_\_\_
- A. Tuberculosis
  - B. Sarcoidosis
  - C. Crohn's disease
  - D. all of the above
30. Which of the following is not a type of embolism?
- A. Amniotic fluid embolism
  - B. Fat embolism
  - C. Air embolism
  - D. Immune embolism
31. Which of the following stain is used to highlight calcification in tissue sections?
- A. Orcein stain
  - B. Von Kossa stain
  - C. Methanamine silver stain
  - D. Oil red O stain

32. Special stains used to highlight amyloid deposit are all of the following, except \_\_\_\_\_
- A. Congo red
  - B. Crystal violet
  - C. Thioflavin S
  - D. Reticulin
33. Which of the following is the characteristic of a malignant tumor?
- A. Metastasis
  - B. Well differentiated morphology
  - C. Slow growth
  - D. Absence of local infiltration
34. Which of the following is not an oncogenic virus?
- A. Human papilloma virus
  - B. Epstein-Barr virus
  - C. HTLV-1
  - D. Helicobacter pylori
35. Which of the following is false regarding Papanicolaou (Pap) test?
- A. Papanicolaou test is a routine screening procedure.
  - B. It is used to detect precancerous lesions.
  - C. The person may also be referred for HPV DNA testing as an adjunct test.
  - D. The procedure always requires ultrasonography.

36. Chicken pox is caused by \_\_\_\_\_
- A. Varicella-Zoster virus
  - B. Human papilloma virus
  - C. Epstein-Barr virus
  - D. Variola virus
37. Anthrax is caused by \_\_\_\_\_
- A. Bacillus anthracis
  - B. Listeria monocytogenes
  - C. Enterococci
  - D. Staphylococcus anthracis
38. 'Owl-eye' appearance of viral inclusions is seen in \_\_\_\_\_
- A. human papillomavirus infection
  - B. Herpes simplex virus infection
  - C. Cytomegalovirus infection
  - D. EBV infection
39. Which serum tumor marker is elevated in medullary thyroid carcinoma?
- A. CA-125
  - B. CA19.9
  - C. Calcitonin
  - D. Alphafeto-protein
40. Krukenberg tumor is \_\_\_\_\_
- A. metastatic signet ring cell adenocarcinoma in ovary
  - B. keratinizing squamous carcinoma of the larynx
  - C. small cell carcinoma metastatic to scalene node
  - D. colonic carcinoma metastatic to supraclavicular node

41. Which of the following is not a common cell population in cerebrospinal fluid?
- A. Lymphocyte
  - B. Ependymal cells
  - C. Monocyte
  - D. Schwann cells
42. Which of the following sequence correctly describes the cell cycle?
- A. S, G1, M, G2
  - B. G1, S, G2, M
  - C. M, G1, G2, S
  - D. S, G2, M, G1
43. Which of the following is the correct order of the stages of prophase I of meiotic division?
- A. Diplotene, Pachytene, Zygotene, Leptotene, Diakinesis
  - B. Diakinesis, Diplotene, Zygotene, Leptotene, Pachytene
  - C. Leptotene, Zygotene, Pachytene, Diplotene, Diakinesis
  - D. Diplotene, Zygotene, Leptotene, Pachytene, Diakinesis
44. What does light emitted as side scatter (SSC) measure in flow cytometry?
- A. Cell size
  - B. Cell granularity
  - C. Cell surface marker
  - D. Fluorescence intensity

45. A woman's lifetime risk of developing breast and / ovarian cancer is markedly increased if she inherits harmful mutations in the gene \_\_\_\_\_
- A. BRCA1&2
  - B. MET
  - C. Retinoblastoma
  - D. RET
46. Special stain commonly used for elastic fibers is \_\_\_\_\_
- A. Verhoeff-Van-Gieson stain
  - B. Masson Fontana stain
  - C. PAS stain
  - D. Grocotts methenamine silver stain
47. Southern blot is a technique for detection of \_\_\_\_\_
- A. DNA
  - B. RNA
  - C. Glycolipids
  - D. Proteins
48. The average volume of a red blood cell is known as \_\_\_\_\_
- A. MCV
  - B. MCH
  - C. MCHC
  - D. RDW

49. Causes of megaloblastic anemia include \_\_\_\_\_

- A. intrinsic factor deficiency
- B. folic acid antagonist
- C. vitamin B12 deficiency
- D. all of the above

50. Serum as compared to plasma lacks \_\_\_\_\_

- A. Electrolytes
- B. Minerals and hormones
- C. Antibodies
- D. Fibrinogen

**SPACE FOR ROUGH WORK**