

भारतीय प्रौद्योगिकी संस्थान रुड़की
Indian Institute of Technology Roorkee

RECRUITMENT EXAMINATION FOR
JUNIOR TECHNICAL ARCHITECT (GROUP 'B')

TIER-I

This booklet consists of 20 pages.

इस पुस्तिका में २० 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

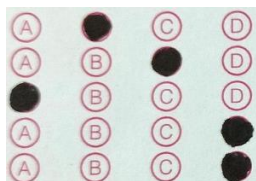
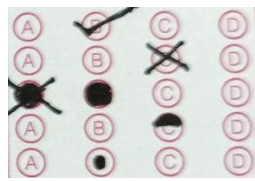
अभ्यर्थी के हस्ताक्षर

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 Q1-Q3:

It was in Germany and France that the first successful attempts were made to produce an internal combustion engine driven by petrol. In England, people were strangely timid about horseless vehicles. English inventors were handicapped by a quaint old law that forbade any such vehicle to attain a speed greater than four miles an hour, and compelled each one to be preceded by a man carrying a red flag. This law was not repealed until 1896. The earliest motor cars were looked upon as mere jokes, or as rather dangerous playthings, by everyone except their inventors. Some of them were single-seaters, others would carry two or even three people; but all were noisy, clumsy, queer-looking things. When in 1888, Carl Benz, a German, produced a three-wheeled, internal-combustion car, a great forward stride had been made. Another German, whose name, Daimler, is often seen on motor cars to this day, was experimenting about the same time, and testing a petrol-driven engine. It is easy to understand how the introduction of the petrol-driven engine revolutionized road transport throughout the world. Until then, the necessary power to push a vehicle along could not be obtained without the cumbersome tanks, boilers and furnaces of the steam engine. The internal combustion engine is light in weight and small in size by comparison; the fuel is burned in it, so that there is no waste, like the dusty cinders of a coal fire.

1. How did most people regard early motor cars?
 - A. Not better than horse-driven vehicles
 - B. A mere joke, or as rather dangerous playthings
 - C. A mere scientific experiment
 - D. A cumbersome vehicle

2. What were all early motor cars?
 - A. A plaything or toy
 - B. A vehicle better than horse-driven vehicle
 - C. Noisy, clumsy, queer-looking things
 - D. Dangerous and risky

3. Which among the following words is closely opposite to 'clumsy'?

- A. Unhandy
- B. Refined
- C. Unusually Large
- D. Unusual

Note: Read the passage below and answer question numbers 4 & 5.

Out of that seed grew this poisonous plant. It is the duty of all of us to fight this poison of hatred and ill-will. If we have learnt anything from Gandhiji, we must bear no ill-will or enmity towards any person. The individual is not our enemy; it is the poison within him that we fight and which we must put an end to it.

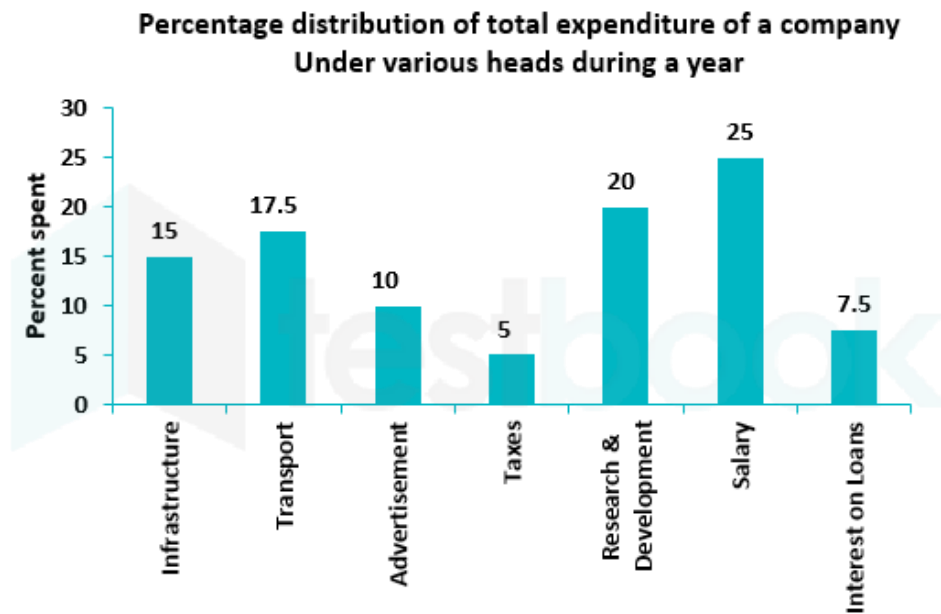
4. How is Gandhiji referred to in the passage?

- A. A mighty soul
- B. Beacon
- C. Compatriot
- D. Poisonous plant

5. What is "poison" referred as in the passage?

- A. a seed that destroys a plant
- B. hatred and ill-will
- C. fighting spirit
- D. jealousy and enmity

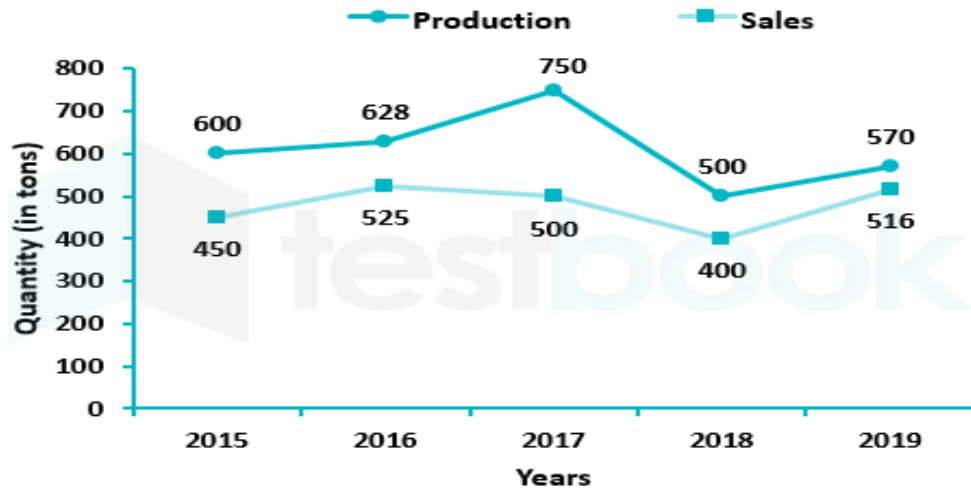
6. Study the graph and answer the question that follows.



The expenditure on Interest on Loans is by what percentage more than the expenditure on Taxes?

- A. 30%
 - B. 50%
 - C. 40%
 - D. 25%
7. In how many ways the letter 'SOLVING' can be rearranged to make 7 letter words such that none of the letters repeat?
- A. 49
 - B. 5040
 - C. 343
 - D. 1

8. In the following line graph, the production (in tonnes) and the sales (in tonnes) of a company is shown. What percentage (approximately) of the total production of the company is the total sales of the company in all the years together? (Correct to 2 decimal places)



- A. 75
- B. 72.55
- C. 68.12
- D. 78.44
9. A man can row 6 km/h in still water. It takes 3 hours more in upstream than in the downstream to cover same distance. If the speed of the current is 2 km/h, then find the distance.
- A. 20 km
- B. 30 km
- C. 38 km
- D. 24 km

10. If the length of the rectangle is increased by 20% and the breadth of the rectangle is decreased by 15%, then find the increase or decrease of the area of the rectangle?
- A. 1% decrease
 - B. 2% increase
 - C. 5% decrease
 - D. 4% increase
11. Which one of the following is the world's first granite temple?
- A. Tanjavur Brihadeshwara Temple
 - B. Shore Temple of Mahabalipuram
 - C. Hampi Virupaksha Temple
 - D. Konark Sun Temple
12. Tawang Monastery, the largest monastery in India, is located in _____
- A. Arunachal Pradesh
 - B. Sikkim
 - C. Ladakh
 - D. Manipur
13. The new Parliament building in India is designed by which architect?
- A. Herbert Baker
 - B. Bimal Patel
 - C. Adani Group
 - D. Ram V Sutar

14. GPLS: 54::WGSK: ?

- A. 70
- B. 60
- C. 65
- D. 53

15. A and B are brothers. C and D are sisters. A's son is D's brother. How is B related to C?

- A. Father
- B. Brother
- C. Uncle
- D. Grandfather

16. Match the items of work in Group-I and the units used for its estimation in Group-II

Group-I		Group-II	
P	Honeycomb brickwork	1	Cubic meter
Q	Cornices	2	Square meter
R	Reinforcement	3	Running meter
S	Woodwork in doors/windows	4	Quintal

- A. P – 1, Q – 2, R – 3, S – 4
- B. P – 3, Q – 2, R – 4, S – 4
- C. P – 2, Q – 3, R – 4, S – 3
- D. P – 2, Q – 4, R – 1, S – 3

17. Which of the following items of work is not measured in square meter in estimation?

- A. Brick flat soling
- B. Lime concrete
- C. Lime terracing
- D. Formwork

18. Which of the following pile foundations is a type of Cased piles?
- Vibro pile
 - Simplex pile
 - Swage pile
 - Franki pile
19. Which of the following brick closers is a type in which the brick is splayed at one end for full width at an angle of 45° to 60° ?
- Queen Closer
 - Mitred Closer
 - Kind Closer
 - Bevelled Closer
20. Match the window type in Group-I and its description in Group-II

Group-I		Group-II	
P	Awning window	1	Top hinged, opens outwards to exterior of house
Q	Lantern window	2	Top hinged, opens inwards to interior of house
R	Hopper window	3	Vertical window on sloped roof
S	Dormer Window	4	Vertical window on flat roof

- P – 1, Q – 2, R – 3, S – 4
 - P – 2, Q – 4, R – 1, S – 3
 - P – 2, Q – 3, R – 4, S – 1
 - P – 1, Q – 4, R – 2, S – 3
21. A semi-circular arch has a span of 2 m. If the thickness of the arch is 30 cm and the width is 60 cm, what is the total quantity of arch masonry?
- 0.36 cubic meter
 - 0.56 cubic meter
 - 0.65 cubic meter
 - 1.13 cubic meter

22. A seminar hall has a volume of 2000 m^3 , and the total absorption of all acoustic materials without any audience is 80 m^2 Sabine. What is the reverberation time of the empty hall (in seconds)?

- A. 1.0
- B. 4.0
- C. 8.0
- D. 12.0

23. What is the percentage added in estimates for contingencies?

- A. 1%
- B. 6%
- C. 3%
- D. 2%

24. Match the contemporary buildings in Group I with their architects in Group II:

Group-I		Group-II	
P	Vitra Design Museum, Basel	1	Adrian Smith
Q	Turning Torso, Malmo	2	Jean Nouvel
R	Burj Khalifa, Dubai	3	Herzog de Meuron
S	Tate Modern, London	4	Santiago Calatrava
		5	Frank O Gehry

- A. P – 2, Q – 4, R – 2, S – 5
- B. P – 5, Q – 4, R – 1, S – 3
- C. P – 5, Q – 3, R – 1, S – 2
- D. P – 5, Q – 3, R – 2, S – 1

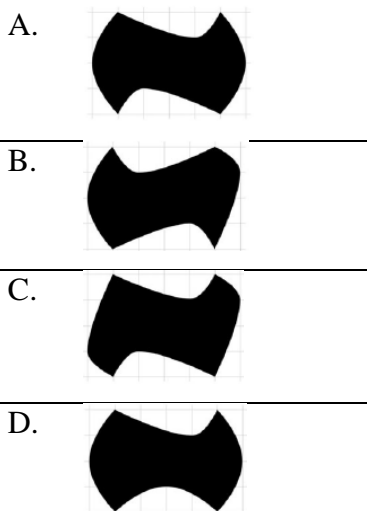
25. The Pritzker Architecture Prize for the year 2023 has been awarded to _____

- A. Alejandro Aravena
- B. Balkrishna Doshi
- C. Arata Isozaki
- D. David Alan Chipperfield CH

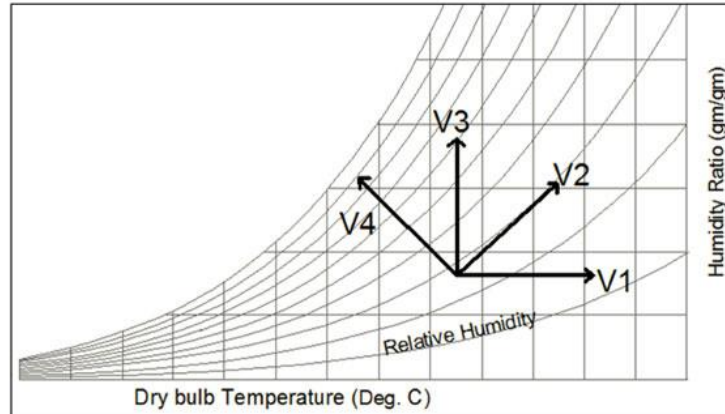
26. Match the heritage conservation charter in Group I with their focus areas in Group II:

Group-I		Group-II	
P	Washington Charter	1	Conservation of historic gardens
Q	Florence Charter	2	Conservation of places of cultural significance
R	Venice Charter	3	Authenticity
S	Burra Charter	4	Conservation and restoration of monuments and sites
		5	Conservation of historic towns

- A. P – 3, Q – 1, R – 4, S – 2
- B. P – 5, Q – 1, R – 4, S – 2
- C. P – 5, Q – 4, R – 1, S – 2
- D. P – 4, Q – 1, R – 3, S – 2
27. What is SLACK in PERT?
- A. Minimum possible time required to accomplish an activity
- B. Excess time and resources available to complete a task.
- C. Longest possible continuous pathway from initial event to terminal event
- D. Maximum possible time required to accomplish an activity.
28. Which of the following shapes can be used as an interlocking paver block without adding any other shape?

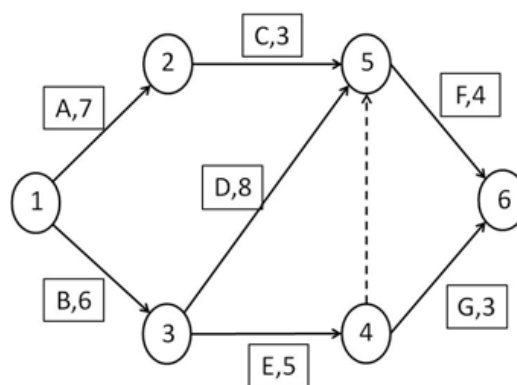


29. Based on the psychrometric chart given below, match the vector in Group I to the respective process in Group II:



Group-I		Group-II	
P	V1	1	Heating and humidification
Q	V2	2	Cooling and humidification
R	V3	3	Heating and dehumidification
S	V4	4	Sensible heating
		5	Humidification

- A. P – 4, Q – 1, R – 5, S – 2
 B. P – 4, Q – 3, R – 1, S – 5
 C. P – 5, Q – 3, R – 4, S – 1
 D. P – 3, Q – 1, R – 5, S – 2
30. A CPM network of a construction project is given in the figure below. The activity durations are mentioned in weeks. What is the project completion time (in weeks)?



- A. 14
 B. 25
 C. 18
 D. 12

31. What is the unit of amplitude?
- A. Meter
 - B. Hertz
 - C. Seconds
 - D. Newton
32. The correct sequence of generic elements in a classical order arranged from top to bottom is _____
- A. Architrave – Frieze – Capital – Cornice – Shaft – Pedestal – Base
 - B. Architrave – Capital – Cornice – Frieze – Base – Shaft – Pedestal
 - C. Cornice – Frieze – Architrave – Capital – Shaft – Base – Pedestal
 - D. Cornice – Capital – Frieze – Architrave – Shaft – Pedestal – Base
33. The triad of secondary colours is _____
- A. Cyan, Magenta, Yellow
 - B. Red, Green, Blue
 - C. Purple, Green, Orange
 - D. Magenta, Blue, Yellow
34. Name of the command in AutoCAD that extends the dimensions of a 2D object or a 3D face into a 3D space is _____
- A. FLATSHOT
 - B. EXTRUDE
 - C. EXTEND
 - D. INTERSECT

35. 'Agora' was provided in Greek towns as a place of _____
- A. Worship
 - B. Meeting
 - C. Drama
 - D. Sports
36. 'Cover block' is used as a building construction component in _____
- A. Brick wall
 - B. Curtain wall
 - C. Steel truss
 - D. RC Beam
37. Which of the following is an example of Indo-Saracenic architecture _____
- A. Mysore Palace
 - B. Taj Mahal
 - C. Sher Shah's tomb
 - D. Bahai Temple
38. The first instance of 'Squinch' is found in _____
- A. Alai Darwaza
 - B. Sikander Lodhi's tomb
 - C. Iltutmish tomb
 - D. Balban's tomb
39. Which of the following are not one of the five design principles of Le Corbusier?
- A. Pilotis
 - B. Roof garden
 - C. Horizontal windows
 - D. Modular ground plan

40. Which of the following statements are correct?

- (i) Urban Heat Island is a phenomenon caused by absorption of a high percentage of radiation by the built mass in urban areas.
- (ii) Urban Heat Island is a phenomenon caused by high density and high-rise constructions.
- (iii) Urban Heat Island is a phenomenon caused in low-rise built-up areas.

A. i, ii and iii

B. i and ii only

C. i and iii only

D. ii only

41. As per the National Building Code of India, 2016, the country is divided into how many seismic zones?

A. 9

B. 5

C. 6

D. 4

42. Associate the historic buildings in Group I with their predominant materials in Group II:

Group-I		Group-II	
P	Lingaraj Temple, Bhubaneswar	1	Red Sandstone
Q	Victoria Memorial, Kolkata	2	Timber
R	Padmanabhapuram Palace, Thuckalay	3	Terracotta tiles
S	Humayun's Tomb, Delhi	4	Sandstone and laterite
		5	Marble

A. P – 1, Q – 2, R – 3, S – 5

B. P – 1, Q – 4, R – 3, S – 5

C. P – 2, Q – 1, R – 3, S – 4

D. P – 4, Q – 5, R – 2, S – 1

43. A rectangular beam section of size 300 mm (width) x 500 mm (depth) is loaded with a shear force of 600 kN.

The maximum shear stress on the section in N/mm^2 is _____

- A. 5
- B. 6
- C. 4
- D. 8

44. Which of the following is a Vector Graphics Software?

- A. Inkscape
- B. Odeon
- C. Adobe Dreamweaver
- D. DesignBuilder

45. The estimated number of bricks (unit size: 250 mm x 125 mm x 75 mm) for laying one course of 250 mm thick brick wall using rat trap bond for a running length of 3.9 meters will be _____

- A. 39
- B. 34
- C. 36
- D. 39

46. In which year The Architect's Act was introduced?

- A. 1971
- B. 1970
- C. 1972
- D. 1974

47. What is 'Easement Right of Way'?

- A. The type of easement which gives someone the right to extend the building line till the abutting road.

- B. The type of easement that gives someone the right to travel across property owned by another person.

- C. The type of easement which gives someone the right to extend the building line till the service road.

- D. The type of easement which gives someone the right to extend the building line till the abutting plot's boundary line.

48. Zinc coating is given over the steel reinforcement to _____

- A. Increase tensile strength
- B. Reduce bending capacity
- C. Reduce corrosion
- D. Increase bond strength

49. Calculate the number of light fixtures required in an office room of 8 m x 7 m, requiring an illumination level of 400 lux on the work plane. Each light fixture has a rated output of 7350 lumens. Assume a utilization factor of 0.5 and maintenance factor of 0.8.

- A. 8
- B. 7
- C. 10
- D. 12

50. The Neo-Classical movement in the 18th Century began as a reaction against _____

- A. Baroque Style
- B. Gothic Style
- C. Renaissance style
- D. Romanesque style

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK