



RRB JE 2025 CBT-2 Mechanical

Junior Engineer • Mechanical Engineering • CEN 05/2025 • CBT-2 • Question Paper

Marathi

Complete Paper • 150 Questions • Official Answer Key

About this Compilation

This booklet contains the complete question paper of the **RRB JE 2025 CBT-2 (Mechanical Engineering)** examination in **Marathi**, with the correct option marked as per the official answer key.

✓ Correct option (highlighted green)

106 of these 150 questions are shown in English. RRB did not release them in Marathi to any candidate whose response sheet we could reach, so the official English version is printed instead and marked with an **ENGLISH** chip. Nothing here is machine translated.

11 of these 150 questions are in English in every language paper (for example Reading Comprehension, which RRB sets in English). They are printed as asked, marked with an **ENGLISH** chip.

How to use

- Use the **Index** page to jump directly to any set (clickable).
- Questions appear section by section in the order of the paper, numbered 1 onward.
- Diagram and wide-table questions appear at full width at the end of their section.
- The correct answer is highlighted in green with a tick.

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Index — All Sets (click to open)

Set 1

02 Jul 2026

9:00 AM - 11:00 AM

General Abilities

50 Questions • Answer Key

Q1 General Abilities ENGLISH

Which of the following statements is true about the Outbox?

- A. It is used to receive incoming emails.
- B. It contains emails that are currently being drafted.
- C. It temporarily stores emails that are queued for sending. ✓
- D. It holds emails that have been successfully sent.

Q2 General Abilities ENGLISH

Which experimental discovery contradicted Thomson's model of the atom and led to its rejection?

- A. Observation of line spectra of hydrogen by Bohr
- B. Alpha particle scattering showing deflection at large angles ✓
- C. Measurement of atomic radius using X-ray diffraction
- D. Discovery of the neutron by James Chadwick

Q3 General Abilities ENGLISH

Which condition is required for a displacement reaction between a metal and salt solution?

- A. Reaction must be endothermic
- B. Salt must be insoluble in water
- C. Metal must be same as salt constituent
- D. Metal must be higher in reactivity series ✓

Q4 General Abilities ENGLISH

Which type of computer virus attaches itself to executable files and gets activated when the file is run?

- A. Boot Sector Virus
- B. File Infector Virus ✓
- C. Macro Virus
- D. Worm

Q5 General Abilities

एका बांधकाम कामगाराला तरफेचा (lever) वापर करून एक जड लोखंडी तुळई (metal beam) उचलायची आहे, परंतु त्याच्याकडे असलेल्या फळीची लांबी मर्यादित आहे. जर टेकूची (fulcrum) जागा बदलता येत असेल पण फळीची लांबी तीच राहत असेल, तर कोणत्या समायोजनामुळे कामगाराला सर्वात कमी प्रयत्नाने तुळई उचलता येईल?

- A. कोणत्याही बिंदूवर टेकू स्थिर ठेवा
- B. टेकू कामगाराच्या जवळ सरकवा
- C. फळीच्या मध्यभागी टेकू ठेवा
- D. टेकू तुळईच्या जवळ सरकवा ✓

Q6 General Abilities ENGLISH

The Atal Bhujal Yojana 2020 focused on improving water resources management of how many states?

- A. seven ✓
- B. eight
- C. five
- D. ten

Q7 General Abilities

खालीलपैकी कोणते/कोणती कारणे ईमेल फसवणूक किंवा फिशिंगच्या जाळ्यात अडकण्यास कारणीभूत ठरतात?

- A) फायदेशीर ऑफर्सकडे लक्ष देणे.
- B) अज्ञात प्रेषकांकडून आलेल्या लिंक्स किंवा ॲटॅचमेंट्स न बघणे.
- C) ईमेलद्वारे अधिकृत माहिती देणे.
- D) ईमेलमध्ये पाठवलेल्या कंपनीच्या लोगोकडे लक्ष देणे.

- A. केवळ A
- B. केवळ A, B
- C. केवळ A, B, D
- D. केवळ A, B, C ✓

Q8 General Abilities

खालीलपैकी कोणता निर्देशक प्रामुख्याने शाश्वत विकासाचे मोजमाप करण्यासाठी वापरला जात नाही?

- A. इकोलॉजिकल फूटप्रिंट
- B. मानव विकास निर्देशांक (HDI)
- C. सकल देशांतर्गत उत्पादन (GDP) वाढीचा दर ✓
- D. बायो कर्पेसिटी



Q9 General Abilities **ENGLISH**

What is the general formula of alkenes?

A. C_nH_{2n}



B. C_nH_n

C. C_nH_{2n-2}

D. C_nH_{2n+2}

Q10 General Abilities **ENGLISH**

The primary method of managing biodegradable domestic waste after collection is _____.

A. burnt in open air

B. sending for recycling

C. conversion into compost



D. throwing into sewers

Q11 General Abilities

कोल विद्रोहाचा (1831 – 32) प्रामुख्याने कोणत्या पठारी प्रदेशावर परिणाम झाला?

A. छोटानागपूर पठार



B. मेघालय पठार

C. दख्खनचे पठार

D. माळवा पठार

Q12 General Abilities

खालीलपैकी कोणती नदी पूर्व किनारपट्टीच्या मैदानी प्रदेशात त्रिभुज प्रदेश निर्माण करते?

A. गोदावरी



B. तापी

C. नर्मदा

D. गंगा

Q13 General Abilities

थॉमसनच्या प्रारूपानुसार, अणूमध्ये इलेक्ट्रॉनची मांडणी कशी केलेली असते?

A. कलिंगडातील बियांसारख्या धनप्रभारित केलेल्या गोलात त्यांना अंतर्भूत केलेले असणे



B. केंद्रकाच्या आत यादृच्छिकपणे स्थित

C. केंद्रकाभोवती स्थिर कक्षेत फिरणे

D. न्यूट्रॉन्सभोवती लंबवर्तुळाकार मार्गांनी परिभ्रमण करणे

Q14 General Abilities

खालीलपैकी कोणते विधान, मानवी डोळ्याची समायोजन शक्ति (power of accommodation) जवळच्या आणि दूरच्या अशा दोन्ही वस्तूंवर लक्ष केंद्रित करण्यास कशी सक्षम करते, याचे सर्वोत्तम वर्णन करते?

सिलिअरी स्नायूंच्या क्रियेद्वारे आपला आकार बदलून

A. डोळ्यातील भिंग आपली नाभीय लांबी (focal length) बदलते.



B. फोकस जुळवण्यासाठी रेटिना (दृष्टिपटल) पुढे-मागे सरकतो.

C. आयरीस (बुबुळ) आत येणाऱ्या प्रकाशाचे प्रमाण नियंत्रित करते आणि दृष्टी केंद्रित करण्यास मदत करते.

D. स्पष्ट दृष्टीसाठी आवश्यक असलेली सर्व फोकसिंग क्षमता कॉर्निया (पारपटल) पुरवते.

Q15 General Abilities

प्रदूषकांचा कोणता गट सामान्यतः महासागरांमधील तेल गळतीशी संबंधित आहे?

A. कृत्रिम डिटर्जंट

B. रासायनिक खते

C. कृषी कीटकनाशके

D. पेट्रोलियम उत्पादने

**Q16 General Abilities** **ENGLISH**

The primary goal of the Pradhan Mantri Gram Sadak Yojana (PMGSY) is to:

A. Enhance telecommunication services in cities

B. Develop urban infrastructure

C. Provide rural connectivity through road construction



D. Promote renewable energy usage

Q17 General Abilities **ENGLISH**

If cell A1 = 10 and B1 = 20, what will `=A1+B1` return?

A. 1020

B. Error

C. 30



D. 200



Q18 General Abilities

मुंबईतील 1888 मध्ये पूर्ण झालेल्या कोणत्या ब्रिटिश वसाहतकालीन इमारतीमध्ये व्हिक्टोरियन गॉथिक आणि भारतीय वास्तुकलेच्या घटकांचा मिलाफ दिसून येतो?

- A. राजाबाई क्लॉक टॉवर
- B. गेटवे ऑफ इंडिया
- C. बॉम्बे टाउन हॉल
- D. छत्रपती शिवाजी महाराज टर्मिनस

Q19 General Abilities ENGLISH

A student pushes a heavy box that is already moving across a rough floor. If the force applied by the student is exactly equal to the frictional force opposing the motion, what will happen to the box?

- A. The box will accelerate forward
- B. The box will move at increasing speed
- C. The box will gradually come to rest
- D. The box will move at a constant speed

Q20 General Abilities

स्टेट ऍक्शन प्लॅन ऑन क्लायमेट चेंज (SAPCC) अनुकूलन नियोजनात सामान्यतः कोणत्या क्षेत्रांच्या जोडीचा विचार (addressed) एकत्रितपणे केला जातो?

- A. वस्त्र डिझाइन आणि फॅशन विपणन
- B. जलसंपदा आणि आरोग्य व्यवस्था
- C. माहिती तंत्रज्ञान आणि अंतराळ संशोधन
- D. अवजड उद्योग आणि मनोरंजन

Q21 General Abilities ENGLISH

What file extension is used to save an MS PowerPoint 2021 presentation?

- A. .pdf
- B. .pptx
- C. .xlsx
- D. .docx

Q22 General Abilities ENGLISH

If 10 grams of salt are dissolved in 100 mL of water, which component is the solute?

- A. Both salt and water
- B. Water only
- C. Salt only
- D. Neither

Q23 General Abilities ENGLISH

Who won the maximum number of medals at the 38th National Games of India?

- A. Neeraj Chopra
- B. Dhinidhi Desinghu
- C. Bajrang Punia
- D. Manu Bhaker

Q24 General Abilities ENGLISH

Which function returns the smallest value?

- A. AVERAGE
- B. MAX()
- C. MIN()
- D. COUNT()

Q25 General Abilities ENGLISH

Which Quick Style type is applied only to selected words or individual characters within a paragraph in MS Word 2010?

- A. Linked styles
- B. Character styles
- C. Page styles
- D. Paragraph styles

Q26 General Abilities ENGLISH

You want to automatically advance slides with narration and animations during a presentation. Which MS PowerPoint feature should you use to achieve this?

- A. Presenter View
- B. Slide Sorter
- C. Action Buttons
- D. Rehearse Timings



Q27 General Abilities ENGLISH

A student accidentally spills some hydrochloric acid on a table. Which substance should be used to neutralise the acid safely?

- A. Sugar solution
- B. Baking soda solution ✓
- C. Vinegar
- D. Lemon juice

Q28 General Abilities ENGLISH

A field exposed to excessive pesticide use shows a sharp decline in earthworm population. The resulting effect on soil is:

- A. Enhanced decomposition
- B. Reduced soil fertility ✓
- C. Increased water retention
- D. Improved aeration

Q29 General Abilities

वस्त्रोद्योग मंत्रालयाच्या समन्वयाने, 11 वा राष्ट्रीय हातमाग दिन भारतात कधी साजरा करण्यात आला?

- A. 7 सप्टेंबर, 2025
- B. 7 ऑगस्ट 2025 ✓
- C. 7 नोव्हेंबर, 2025
- D. 7 ऑक्टोबर, 2025

Q30 General Abilities

'स्मॉग' (smog) हा शब्द _____ यांचे मिश्रण आहे.

- A. धुके आणि धुके
- B. धूर आणि नीहार ✓
- C. धुके आणि ढग
- D. धूर आणि विरल धुके

Q31 General Abilities ENGLISH

Consider the following statements regarding chemical reactions and choose the correct option.

Statement I: Every reaction in which two or more reactants combine to form a single product is classified as a combination reaction regardless of heat change.

Statement II: The reaction $\text{CaO(s)} + \text{H}_2\text{O(l)} \rightarrow$

$\text{Ca(OH)}_2\text{(aq)} + \text{heat}$ is both a combination reaction and an exothermic reaction.

- A. Both statements are incorrect
- B. Only Statement I is correct
- C. Only Statement II is correct
- D. Both statements are correct ✓

Q32 General Abilities ENGLISH

Which of the following best describes how sound travels through air?

- A. The air particles remain stationary while the wave moves through
- B. The air particles vibrate back and forth parallel to the direction of the wave ✓
- C. The air particles move in circular paths as the wave passes
- D. The air particles vibrate up and down perpendicular to the direction of the wave

Q33 General Abilities ENGLISH

Which new warship was commissioned by the Indian Navy in November, 2025, to strengthen anti-submarine and coastal defence capabilities?

- A. INS Ikshak
- B. INS Mahe ✓
- C. INS Arnala
- D. INS Vikrant



Q34 General Abilities

खालीलपैकी कोणते विधान विद्युतप्रवाह वाहून नेणाऱ्या सरळ विद्युतवाहकाच्या सभोवतालच्या चुंबकीय क्षेत्र रेषांच्या वर्तनाचे सर्वोत्तम वर्णन करते?

- A. त्या तारेपासून सरळ बाहेरच्या दिशेने पसरतात.
- B. त्या तारेवरून यादृच्छिकपणे आपली दिशा बदलतात.
- C. त्या तारेला समांतर सरळ रेषा असतात.
- D. ती वाहकावर केंद्रित असलेली समकेंद्री वर्तुळे तयार करतात. ✓

Q35 General Abilities ENGLISH

Which of the following satellites was launched on November 2, 2025, to enhance the Indian Navy's secure communication network and maritime surveillance capabilities?

- A. RISAT-2B
- B. Cartosat-3
- C. GSAT-6A
- D. CMS-03 (GSAT-7R) ✓

Q36 General Abilities

भारतात, राष्ट्रीय हातमाग दिन कोणत्या दिवशी पाळला जातो?

- A. 7 ऑगस्ट ✓
- B. 5 सप्टेंबर
- C. 2 ऑक्टोबर
- D. 18 ऑगस्ट

Q37 General Abilities

19 व्या शतकातील मप्पिला बंड प्रामुख्याने भारताच्या कोणत्या प्रदेशात झाले?

- A. महाराष्ट्राचा कोकण प्रदेश
- B. केरळचा मलबार प्रदेश ✓
- C. पश्चिम बंगालचा सुंदरबन प्रदेश
- D. तमिळनाडूचा कोरोमंडल किनारा

Q38 General Abilities ENGLISH

A factory plans to install a powerful electromagnet for lifting metal scraps. To maximize the magnetic field strength around the coil, which of the following combinations would be most effective?

- A. Using an air core, decreasing coil turns, and keeping current constant
- B. Using a soft iron core, increasing coil turns, and increasing current through the coil ✓
- C. Using a copper core, increasing coil turns, and lowering current
- D. Using a steel core, decreasing coil turns, and lowering current

Q39 General Abilities

खालीलपैकी कोणते, भारताच्या हवामान बदलविषयक राष्ट्रीय कृती आराखड्या (NAPCC) अंतर्गत एक प्रमुख अभियान आहे?

- A. राष्ट्रीय ग्रामीण उपजीविका अभियान
- B. राष्ट्रीय महामार्ग विकास प्रकल्प
- C. राष्ट्रीय पोषण अभियान
- D. राष्ट्रीय सौर अभियान ✓

Q40 General Abilities ENGLISH

Biomedical waste handlers in a hospital are at risk of occupational hazards. The most effective way to protect them from exposure to infectious materials is:

- A. Regular medical check-ups
- B. Vaccination against common infections
- C. Use of protective equipment and safe handling ✓
- D. Segregation of waste into color-coded bins



Q41 General Abilities

खालील स्तंभांच्या जोड्या लावा.

माफी देण्याचा अधिकार	कार्य
1. लघुकरण (Commutation)	a. शिक्षा आणि दोषसिद्धी दोन्ही पूर्णपणे रद्द करणे.
2. प्रविलंबन (Reprieve)	b. विशेष परिस्थितीमुळे मूळ शिक्षेऐवजी कमी शिक्षा देणे.
3. विराम (Respite)	c. शिक्षेचे स्वरूप न बदलता केवळ तिचा कालावधी कमी करणे.
4. परिहार (Remission)	d. शिक्षेच्या अंमलबजावणीला तात्पुरती स्थगिती देणे.
5. क्षमा (Pardon)	e. शिक्षेचे स्वरूप बदलून ते सौम्य करणे.

A. 1-d, 2-b, 3-e, 4-c, 5-a

B. 1-e, 2-d, 3-b, 4-c, 5-a

C. 1-c, 2-e, 3-b, 4-a, 5-d

D. 1-a, 2-c, 3-d, 4-e, 5-b

Q42 General Abilities **ENGLISH**

Which of the following options must be DISABLED before manually setting the date and time in Windows?

A. Set time zone globally

B. Enable multiple clocks

C. Night Light

D. Set time automatically

Q43 General Abilities **ENGLISH**

In a real-life scenario, a chemist discovers a compound with the formula $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{OH}$. What is the correct IUPAC name for this compound?

A. 3-methylpentan-1-ol

B. 3-methylhexanol

C. 4-methylpentanol

D. 2-methylhexanol

Q44 General Abilities

सल्फर डायऑक्साइडमुळे श्वसनमार्गाच्या वरच्या भागातील श्लेष्मल पटलाची (mucous membrane) जळजळ होण्याचे मुख्य कारण काय आहे?

A. त्याचे ऑक्सिडीकरण होऊन सल्फर ट्रायऑक्साइड तयार होते आणि ते श्वासावाटे फुफ्फुसांमध्ये खोलवर जाते.

B. ते हिमोग्लोबिनशी संयोग पावते आणि ऑक्सिजनच्या वहनावर परिणाम करते.

C. ते इतर प्रदूषकांशी संयोग पावते आणि फुफ्फुसांमध्ये पॉलिमराइज होते.

D. हे श्वसनमार्गाच्या वरच्या भागातील आर्द्रतेत विरघळते आणि जळजळ निर्माण करणारा पदार्थ तयार करते.

Q45 General Abilities

एक शेतकरी अनेक वर्षांपासून मोठ्या प्रमाणात रासायनिक खतांचा वापर करतो. या पद्धतीमुळे होणाऱ्या कोणत्या परिणामांमुळे मृदा प्रदूषण होण्याची सर्वाधिक शक्यता आहे?

A. गांडुळांच्या संख्येत वाढ

B. पृष्ठभागावरील मातीच्या थरांची धूप

C. प्रत्येक हंगामात वनस्पतींची जलद वाढ

D. जमिनीत विषारी पदार्थांचा संचय

Q46 General Abilities **ENGLISH**

According to the Article 75 of the Indian Constitution, the total number of ministers (including the Prime Minister) in the Council of Ministers shall NOT exceed what percentage of the total members of the House of the People, i.e., Lok Sabha?

A. 25%

B. 10%

C. 15%

D. 20%

Q47 General Abilities **ENGLISH**

Which of the following best describes the velocity-time graph for an object moving with uniform velocity?

A. A curved line above the time axis

B. A straight horizontal line parallel to the time axis

C. A line starting from the origin and sloping upwards

D. A straight line sloping upwards from the time axis



Q48 General Abilities

खालीलपैकी कोणते अनुच्छेद व्यक्तींना अधिसंघ किंवा संघ किंवा सहकारी संस्था स्थापन करण्याच्या अधिकाराबद्दल सांगते?

- A. अनुच्छेद 19 (1) (b)
- B. अनुच्छेद 19 (1) (c) ✓
- C. अनुच्छेद 19 (1) (d)
- D. अनुच्छेद 19 (1) (a)

Q49 General Abilities ENGLISH

The atmospheric component that remains largely unreactive is _____.

- A. Oxygen
- B. Carbon dioxide
- C. Methane
- D. Argon ✓

Q50 General Abilities ENGLISH

How can we locate a file with a known extension but an unknown name in a large directory?

- A. Using the dir command
- B. Through File Explorer
- C. Using the Search box in File Explorer with *.ext ✓
- D. Checking the Recycle Bin

Technical Abilities

100 Questions • Answer Key

Q51 Technical Abilities ENGLISH

Mild steel shows poor corrosion resistance mainly because it:

- A. Possesses a non-uniform and less stable microstructure
- B. Forms a dense but non-protective oxide layer on the surface
- C. Contains a relatively high amount of carbon
- D. Does not contain protective elements like chromium or nickel ✓

Q52 Technical Abilities ENGLISH

A technician wants to improve flatness and surface quality of a gauge block using lapping. What is the most important factor to control?

- A. Applying excessive force to speed up lapping
- B. Uniform pressure and movement across the surface ✓
- C. Using coarse abrasives for faster removal
- D. High temperature and fast lap speed

Q53 Technical Abilities ENGLISH

Which component in a cylindrical grinding machine provides longitudinal movement to the workpiece?

- A. Table with sliding mechanism ✓
- B. Spindle for work rotation
- C. Wheel guard for safety
- D. Coolant system with pump

Q54 Technical Abilities ENGLISH

What is the main chemical change that occurs on the metal surface during anodizing?

- A. Deposition of metallic ions
- B. Formation of a thick oxide layer ✓
- C. Dissolving the metal away
- D. Removal of the oxide layer



Q55 Technical Abilities ENGLISH

How do the gear mechanism and braking system in a hoist contribute to safe lifting operations?

- A. Both gear mechanism and brake system work only during lowering of load
- B. The brake system increases speed and the gear mechanism holds the load steady
- C. The gear mechanism increases speed and the brake system adds force to lifting
- D. The gear mechanism reduces speed while the brake system holds the load steady ✓

Q56 Technical Abilities ENGLISH

You must inspect a welded aluminum structure for both surface and internal defects with minimal health risk to operators. Which combination of tests is most appropriate?

- A. Dye penetrant and ultrasonic testing ✓
- B. Radiographic and magnetic particle testing
- C. Radiographic and ultrasonic testing
- D. Visual and magnetic particle testing

Q57 Technical Abilities ENGLISH

What is the typical least count of a bevel protractor with a vernier scale?

- A. 10 minutes
- B. 1°
- C. 0.1°
- D. 5 minutes ✓

Q58 Technical Abilities ENGLISH

Corrosion resistance of alloy steels can be increased further by:

- A. Increasing the overall carbon content in the alloy
- B. Using protective coatings or chemical passivation treatment ✓
- C. Adding a small percentage of copper to the composition
- D. Improving surface finish through mechanical polishing

Q59 Technical Abilities

कंपरेटरची कार्यपद्धती कशावर आधारित असते?

- A. अचूकपणे कॅलिब्रेट केलेल्या स्केलचा वापर
- B. लिमिट गेजचा (limit gauges) वापर
- C. स्लिप गेजसारख्या (slip gauges) ज्ञात मानकांशी तुलना ✓
- D. ऑप्टिकल मापन प्रणाली

Q60 Technical Abilities ENGLISH

The ideal gas law for isothermal process can be represented as _____, (P is the pressure and V is the volume of the gas at any stage).

- A. $P/V = \text{Constant}$.
- B. $PV = \text{Constant}$. ✓
- C. $P = \text{constant}$.
- D. $V = \text{constant}$.

Q61 Technical Abilities ENGLISH

The type of surface produced by a taper turning operation performed on a lathe machine is:

- A. cylindrical
- B. flat
- C. conical ✓
- D. curved one

Q62 Technical Abilities ENGLISH

Which material handling equipment would be most suitable for transferring bulk granular materials over a long horizontal distance within a factory?

- A. Overhead crane arrangement
- B. Belt conveyor system ✓
- C. Forklift transportation
- D. Pallet truck operation

Q63 Technical Abilities ENGLISH

Which of the following best describes the principle of parkerising?

- A. A paint coating is applied to the surface
- B. A phosphate layer forms by chemical reaction ✓
- C. Surface roughness is increased mechanically
- D. A polymer coating is sprayed on the surface



Q64 Technical Abilities **ENGLISH**

The area under load v/s elongation diagram for a ductile material upto fracture indicates ____.

- A. Modulus of resilience
- B. Resilience
- C. Modulus of toughness
- D. Toughness ✓

Q65 Technical Abilities **ENGLISH**

The primary function of a sine bar is to:

- A. calibrate pressure gauges
- B. measure angles with high accuracy ✓
- C. check thread pitches
- D. measure linear dimensions

Q66 Technical Abilities **ENGLISH**

The most effective method for applying cutting fluid during high-speed machining is:

- A. Flooding ✓
- B. Drip system
- C. Atomized spray
- D. Hand pouring

Q67 Technical Abilities **ENGLISH**

Water as a cutting fluid does NOT spread well over a surface to wet it because of ____.

- A. high buoyancy force
- B. high surface tension ✓
- C. high volatility
- D. low surface tension

Q68 Technical Abilities **ENGLISH**

Why is water mixed with oil often preferred as a grinding coolant over plain water?

- A. It decreases grinding time significantly
- B. It increases corrosion of metals
- C. It makes coolant less effective
- D. It provides both cooling and lubrication ✓

Q69 Technical Abilities **ENGLISH**

With an increase in angle of the inclined surface, the maximum angle at which a body starts sliding down the plane is called ____.

- A. Static friction
- B. limiting friction
- C. angle of friction ✓
- D. cone angle

Q70 Technical Abilities **ENGLISH**

Which of the following is a necessary modification in Newton's second law to derive D'Alembert's principle for a dynamic system?

- A. Include only gravitational forces in the analysis
- B. Omit all resistive forces acting on the system
- C. Replace all forces with their average values
- D. Incorporate a fictitious force equal to "minus mass times acceleration" ✓

Q71 Technical Abilities **ENGLISH**

Given are four concurrent forces: 10 N east, 20 N north, 15 N west, 25 N south. What is the direction of the resultant force?

- A. North-west
- B. South-west ✓
- C. North-east
- D. South-east

Q72 Technical Abilities **ENGLISH**

Which of the following is NOT a type of water-based cutting fluid?

- A. Dispersion
- B. Grease ✓
- C. Emulsion
- D. Solution



Q73 Technical Abilities ENGLISH

A force of 10 N acts along a line OB, which makes an angle of 60° with the horizontal line OA. What is the component of the force along the direction of the acute angle bisector of angle $\angle AOB$?

- A. $10 \sin 30^\circ$ N
- B. 10 N
- C. $10 \cos 30^\circ$ N ✓
- D. $10 \cos 60^\circ$ N

Q74 Technical Abilities ENGLISH

A force of 100 N acting on a rigid body is moved to another point along the same line of action. What is the effect on the external equilibrium of the body?

- A. The external equilibrium remains unchanged ✓
- B. The effect depends on the material
- C. The force magnitude becomes zero
- D. The external equilibrium changes

Q75 Technical Abilities ENGLISH

Which of the following is a limitation of conventional oxy-fuel gas cutting?

- A. Cannot cut mild steel plates
- B. Cannot cut thick carbon steels
- C. Requires electrical input for operation
- D. Cannot cut stainless steel efficiently ✓

Q76 Technical Abilities ENGLISH

If the electrolyte does not contain metal ions of the plating metal, what is the most likely outcome?

- A. The cathode will dissolve in the solution
- B. No metal will deposit on the cathode ✓
- C. The anode will become coated with metal
- D. The process will create a thick oxide layer

Q77 Technical Abilities ENGLISH

A component in a high-impact environment requires resistance to fracture with minimal deformation. Which material property would be most critical to avoid premature failure?

- A. High brittleness with low ductility
- B. High brittleness with high elasticity
- C. Low brittleness with high toughness ✓
- D. Low brittleness with low stiffness

Q78 Technical Abilities

पाण्याखाली पूर्णपणे बुडलेल्या एका क्षितिजसमांतर सपाट पृष्ठभागाचा (submerged horizontal plane surface) दाब केंद्र (center of pressure) कुठे असतो?

- पृष्ठभाग किती अंतर पाण्याखाली आहे याचा परिणाम न झालेली,
A. बुडण्याच्या खोलीपासून (depth of immersion) स्वतंत्र असलेली स्थिती.
- सपाट पृष्ठभागाचे प्रकेंद्र (centroid), जे पाण्याखाली
B. बुडलेल्या क्षेत्राचे भौमितिक केंद्र (geometric center) दर्शवते. ✓
- पाण्याखाली बुडलेल्या पृष्ठभागाची वरची कडा (top edge), जी
C. द्रवाच्या संपर्कातील सर्वात वरची सीमा (uppermost boundary) मानली जाते.
- एकूण द्रवस्थैतिक बलाचा (hydrostatic force) बिंदू, जो पृष्ठभाग कललेला असताना प्रकेंद्राच्या खाली असतो.
D.

Q79 Technical Abilities ENGLISH

Which of the following is a limitation of mechanical comparators?

- A. Mechanical wear can reduce accuracy over time ✓
- B. They cannot measure linear dimensions
- C. They cannot measure small deviations
- D. They require electricity

Q80 Technical Abilities ENGLISH

During the 'Shaping' operation conducted on a workpiece of aluminum material, the type of coolant used is:

- A. kerosene ✓
- B. dry kerosene turpentine
- C. mineral hard oil
- D. cutting compound



Q81 Technical Abilities ENGLISH

A mechanical engineer needs to choose a steel for a structural component that requires moderate ductility and high weldability. Based on the chemical composition and classification, which steel type should be recommended?

- A. Mild steel with low carbon and minimal alloying elements ✓
- B. Mild steel with increased silicon and phosphorus content
- C. Alloy steel with high manganese and vanadium content
- D. Alloy steel with high chromium and nickel content

Q82 Technical Abilities ENGLISH

Under which scenario is a body on an inclined plane most likely to slip when subjected to a parallel force?

- A. Frictional force equals weight of the body
- B. Coefficient of friction is less than tangent of inclination ✓
- C. Normal reaction is greater than weight
- D. Parallel force is opposite to frictional force

Q83 Technical Abilities ENGLISH

During oxy-acetylene gas welding, improper adjustment of the neutral flame can most likely result in which weld defect on stainless steel?

- A. Development of porosity within the weld metal
- B. Formation of significant undercut along the joint
- C. Excessive oxidation at the weld bead surface ✓
- D. Occurrence of incomplete root fusion in the joint

Q84 Technical Abilities ENGLISH

The saddle of a lathe carriage:

- A. Rotates the workpiece against tool
- B. Controls spindle speed automatically
- C. Supports the cross-slide and tool post ✓
- D. Moves the lead screw mechanism

Q85 Technical Abilities ENGLISH

Which characteristic is assessed in the bend test for welded joints?

- A. Chemical composition check
- B. Magnetic properties check
- C. Ductility of the weld metal ✓
- D. Surface finish of the weld

Q86 Technical Abilities ENGLISH

Trackless cranes are mainly used for:

- A. Handling liquid materials only
- B. Operations limited to fixed tracks
- C. Continuous material transport
- D. Lifting loads in confined or uneven areas ✓

Q87 Technical Abilities ENGLISH

Which of the following best describes the function of a hoist in material handling systems?

- A. Moving loads horizontally between different workstations
- B. Rotating loads for alignment during material handling
- C. Sorting materials by size during material handling
- D. Lifting and lowering loads vertically with controlled movement ✓

Q88 Technical Abilities ENGLISH

An LVDT (Linear Variable Differential Transformer) is primarily used in which type of comparator?

- A. Mechanical comparator
- B. Electrical comparator ✓
- C. Pneumatic comparator
- D. Optical comparator

Q89 Technical Abilities ENGLISH

_____ is used to measure the pressure difference in a Venturi meter.

- A. Rotameter
- B. Bourdon gauge
- C. Manometer ✓
- D. Pitot tube



Q90 Technical Abilities

चक्रीय भार (cyclic loading) आणि आघात (impact) सहन करणाऱ्या घटकासाठी साहित्य निवडताना, कडकपणासोबतच (hardness) कोणत्या यांत्रिक गुणधर्माला प्राधान्य दिले पाहिजे?

- A. ऑक्सिडेशन टाळण्यासाठी तन्यतेचा (Ductility) विचार करणे आवश्यक आहे.
- B. वस्तुमान वाढवण्यासाठी आकार्यतेचा (Plasticity) विचार करणे आवश्यक आहे.
- C. अचानक होणारा बिघाड रोखण्यासाठी टणकपणाचा (Toughness) विचार करणे आवश्यक आहे. ✓
- D. उत्तम इन्सुलेशनसाठी लवचिकतेचा (Elasticity) विचार करणे आवश्यक आहे.

Q91 Technical Abilities ENGLISH

The horizontal and vertical components of a 100 N force inclined at 37° with the horizontal are: (consider the approximation of $\sin 37^\circ=0.6$, $\cos 37^\circ=0.8$ and $\tan 37^\circ=0.75$)

- A. 100 N and 0 N
- B. 70 N and 70 N
- C. 60 N and 80 N
- D. 80 N and 60 N ✓

Q92 Technical Abilities ENGLISH

Which of the following plots is used for the classification of types of facilities and layouts used for different levels of the production?

- A. Production quantity vs. product cost plot
- B. Product cost vs. product variety plot
- C. Production quantity vs. product variety plot ✓
- D. Production mass vs. product variety plot

Q93 Technical Abilities ENGLISH

Which defect results from improper shielding during the welding process and causes gas pockets in the weld?

- A. Slag inclusion
- B. Undercut
- C. Porosity ✓
- D. Lack of fusion

Q94 Technical Abilities ENGLISH

When selecting an organic coating for a steel structure exposed to outdoor conditions, which combination of properties should be prioritized for effective long-term performance?

- A. Low viscosity and low electrical insulation properties in the formulation.
- B. Ability to dissolve in water and rapid drying at room temperature.
- C. High chemical reactivity and low cohesion with steel to form a sacrificial layer.
- D. Strong adhesion to substrate and high resistance to ultraviolet radiation. ✓

Q95 Technical Abilities ENGLISH

Which of the following is a primary application of interferometry in metrology?

- A. Calculating torque in shafts using sensors
- B. Analyzing thermal conductivity of metals
- C. Determining chemical composition by spectroscopy
- D. Measuring surface flatness with high precision ✓

Q96 Technical Abilities ENGLISH

Which characteristic best describes the arc in submerged arc welding?

- A. The arc is exposed to the atmosphere during welding
- B. The arc is shielded only by inert gas during welding
- C. The arc is visible and produces bright light during welding
- D. The arc is completely covered by a layer of flux ✓

Q97 Technical Abilities ENGLISH

Why is a steady rest sometimes used in cylindrical grinding?

- A. To hold abrasive materials for grinding
- B. To support long workpieces during rotation ✓
- C. To align the grinding wheel to the table
- D. To cool the workpiece during grinding



Q98 Technical Abilities **ENGLISH**

Intensity of pressure at a point in a fluid is:

- A. Pressure at a point varies significantly with direction even in a static fluid
- B. Normal force per unit area at a point in the fluid, scalar intensity independent of direction ✓
- C. Pressure includes both normal and shear stresses acting simultaneously at a point
- D. Total normal force acting uniformly over a surface, independent of area and location within the fluid

Q99 Technical Abilities **ENGLISH**

Which manufacturing method is primarily used to harden and set silicate-bonded grinding wheels?

- A. Chemical polymerization at room temperature
- B. Low-temperature drying without firing
- C. Controlled firing at moderate temperature ✓
- D. High-pressure forging of abrasive particles

Q100 Technical Abilities **ENGLISH**

Why is facing operation critical for assembly parts?

- A. It reduces the hardness of the material at the surface region.
- B. It improves the cutting tool life during machining operation.
- C. It increases the overall strength of the workpiece material.
- D. It ensures the end surface is flat and perpendicular to the axis. ✓

Q101 Technical Abilities **ENGLISH**

Which type of flux is most suitable for minimizing oxidation in high-temperature aluminum welding applications involving magnesium alloys?

- A. Borax-based flux
- B. Fluoride-based flux ✓
- C. Zinc chloride-based flux
- D. Rosin-based flux

Q102 Technical Abilities **ENGLISH**

A company manufactures a component at a variable cost of ₹40 per unit and incurs a fixed cost of ₹2,00,000 per year. An outside supplier offers the same component at ₹60 per unit. What should the company do if the annual demand is 12,000 units?

- A. Outsource production to the supplier as it saves more money
- B. Split production equally between manufacturing and outsourcing
- C. Continue manufacturing the component in-house as it is more cost-effective ✓
- D. Reduce production and buy the remaining units from the supplier

Q103 Technical Abilities **ENGLISH**

Which of the following best defines the specific weight of a fluid?

- A. The weight of fluid per unit pressure
- B. The weight of fluid per unit volume ✓
- C. The weight of fluid per unit force
- D. The weight of fluid per unit mass

Q104 Technical Abilities **ENGLISH**

Which property most significantly differentiates mild steel from alloy steel when exposed to high-temperature mechanical stress in industrial applications?

- A. Alloy steel maintains higher mechanical strength at elevated temperatures compared to mild steel ✓
- B. Alloy steel demonstrates greater ductility at elevated temperatures than mild steel
- C. Mild steel has enhanced corrosion resistance at high temperatures compared to alloy steel
- D. Mild steel provides improved wear resistance under high temperatures compared to alloy steel



Q105 Technical Abilities

मशीनच्या भागाची बाह्यरेषा अचूकपणे दर्शवण्यासाठी, प्रोफाईल प्रोजेक्शन पद्धतीत कोणता घटक आवश्यक असतो?

- A. विखुरलेला प्रकाश देणारा अर्धपारदर्शक पडदा असलेला साधा लॅम्प
- B. स्क्रीनशी अचूक संरेखन असलेला समांतरित प्रकाश स्रोत ✓
- C. कोनातून प्रकाश प्रक्षेपित करणारी वक्र स्क्रीन
- D. खोलीतील नैसर्गिक किंवा सामान्य प्रकाशात असलेला नॉन-रिफ्लेक्टिव्ह पृष्ठभाग

Q106 Technical Abilities ENGLISH

The lathe bed is designed with which type of guideways?

- A. Rectangular
- B. Triangular
- C. Inverted V and flat combination ✓
- D. Circular

Q107 Technical Abilities ENGLISH

What type of efficiency is most important for an axial flow compressor in high-speed applications?

- A. Mechanical efficiency
- B. Thermal efficiency
- C. Isentropic efficiency ✓
- D. Volumetric efficiency

Q108 Technical Abilities ENGLISH

Which two types of thermodynamic processes constitute the Carnot cycle in an ideal heat engine?

- A. Isothermal and adiabatic ✓
- B. Adiabatic and isochoric
- C. Isobaric and isochoric
- D. Isothermal and isochoric

Q109 Technical Abilities ENGLISH

Which of the following best describes the purpose of ABC analysis in inventory management?

- A. To organize inventory items solely by their production shelf life in warehouse
- B. To store inventory items according to their physical characteristics in the warehouse
- C. To group inventory items based on supplier location and delivery schedule
- D. To categorize inventory items based on significance in value and usage frequency ✓

Q110 Technical Abilities

खालीलपैकी कोणते पॉझिटिव्ह डिस्प्लेसमेंट एअर कंप्रेसरचे (compressor) उदाहरण आहे?

- A. रेसिप्रोकेटिंग पिस्टन कंप्रेसर (Reciprocating piston compressor) ✓
- B. एक्सियल फ्लो कंप्रेसर (Axial flow compressor)
- C. रेडियल डायनॅमिक कंप्रेसर (Radial dynamic compressor)
- D. सेंट्रीफ्यूगल कंप्रेसर (Centrifugal compressor)

Q111 Technical Abilities ENGLISH

If a block slides down a rough plane inclined at 30° with a coefficient of friction of 0.2, the net acceleration is:

- A. Zero
- B. 0.676 g
- C. 0.326 g ✓
- D. 0.5 g

Q112 Technical Abilities ENGLISH

In a workshop, why might a lever-operated hoist be preferred over an electric hoist for certain applications?

- A. Portability and suitability for short, manual lifting operations ✓
- B. High lifting speed and remote control capabilities
- C. Continuous operation and automatic overload protection
- D. Lower initial cost and larger load lifting capacity



Q113 Technical Abilities **ENGLISH**

In _____ process, heat is added during Otto cycle.

A. Constant volume



B. Constant pressure

C. Isentropic compression

D. Isothermal expansion

Q114 Technical Abilities **ENGLISH**

For a simply supported beam with multiple point loads, maximum bending moment occurs where:

A. Deflection = 0

B. Reaction = 0

C. Load = 0

D. Shear force = 0

**Q115** Technical Abilities **ENGLISH**

What is the nature of strain as a physical quantity?

A. It has units of force per area.

B. It has units of volume.

C. It is dimensionless.



D. It has units of length.

Q116 Technical Abilities **ENGLISH**

What is the role of the acute angle attachment in a Bevel Protractor?

A. To adjust the stock

B. To measure acute angles less than 90°



C. To lock the vernier scale

D. To measure linear distances

Q117 Technical Abilities **ENGLISH**

Radial flow pumps are preferred when:

A. Low flow, high head is required



B. Only low suction head is available

C. Flow is very viscous

D. High flow, low head is required

Q118 Technical Abilities **ENGLISH**

A synthetic oil is contained in an accelerating elevator moving upward with acceleration (a). If the pressure intensity at the free surface is atmospheric, the intensity of pressure at a depth (h) below the surface is [take (g) as the acceleration due to gravity]:

A. $P_{atm} - \rho(g-a)h$

B. $P_{atm} + \rho(g+a)h$



C. $P_{atm} + \rho gh$

D. $P_{atm} - \rho gh$

Q119 Technical Abilities **ENGLISH**

When a mild steel bar is loaded in tension within the elastic limit, the relation between stress and strain is:

A. Stress independent of strain

B. $\text{Stress} \propto \sqrt{(\text{Strain})}$

C. $\text{Stress} \propto \text{Strain}$



D. $\text{Stress} \propto (\text{Strain})^2$

Q120 Technical Abilities

खालीलपैकी कोणता वेल्डिंग प्रक्रियेमध्ये एक सामान्य पृष्ठभागीय दोष मानला जातो?

A. मूळ भागापर्यंत (रूटपर्यंत) अपूर्ण पेनेट्रेशन

B. प्लेटमध्ये लॅमेलर टियरिंग

C. वेल्ड बीडच्या कडेला असलेला अंडरकट



D. अतिप्रमाणात साचलेले स्पॅटर

Q121 Technical Abilities

जेव्हा पृष्ठभागांवर द्रवाचा वंगण म्हणून वापर केला जातो, तेव्हा कोणत्या प्रकारचा घर्षण (friction) निर्माण होते?

A. स्टॅटिक फ्रिक्शन (Static friction)

B. रोलिंग फ्रिक्शन (Rolling friction)

C. फिल्म फ्रिक्शन (Film friction)



D. ड्राय फ्रिक्शन (Dry friction)



Q122 Technical Abilities **ENGLISH**

In malleability, material is subjected to which of the following stresses?

A. Compressive stress ✓

B. Fatigue stress

C. Tensile stress

D. Shear stress

Q123 Technical Abilities **ENGLISH**

Which of the following can be measured using interferometry?

A. Frequency of vibration

B. Linear displacement

C. Surface roughness ✓

D. Depth of micro-grooves

Q124 Technical Abilities **ENGLISH**

After leaving the low-pressure cylinder in a two-stage air compressor, where does the air go next?

A. Back to the atmosphere

B. To the high pressure cylinder directly

C. To the intercooler ✓

D. To the air receiver tank

Q125 Technical Abilities **ENGLISH**

For drilling a hole on a lathe, the drilling tool is placed in the ____.

A. chuck

B. tool post

C. tailstock ✓

D. carriage

Q126 Technical Abilities **ENGLISH**

In a scenario where excessive spatter occurs during arc welding, which adjustment is most likely to mitigate the issue without compromising weld quality?

A. Decreasing base metal thickness

B. Reducing arc length slightly ✓

C. Switching to a larger electrode

D. Increasing travel speed marginally

Q127 Technical Abilities **ENGLISH**

A center drill is used before drilling because it:

A. Increases the temperature at the cutting zone

B. Removes burrs and debris from the drilled hole

C. Provides a pilot hole to guide the main drill ✓

D. Reduces the spindle rotation of the lathe

Q128 Technical Abilities **ENGLISH**

In high-performance applications such as turbine shafts and precision gears, alloy steels are favored over mild steels primarily because they:

A. Retain mechanical integrity and hardness under conditions of elevated temperature and cyclic stress ✓

B. Exhibit superior machinability due to refined ferritic microstructure

C. Possess lower density and improved dimensional stability

D. Require less alloying and heat treatment to achieve desired strength

Q129 Technical Abilities

निरपेक्ष दाब (absolute pressure) 2 atm आणि वातावरणीय दाब (atmospheric pressure) 1 atm दिलेले असताना, गेज दाब (gauge pressure) निश्चित करा.

A. 3 atm

B. 2 atm

C. 1 atm ✓

D. 0.5 atm

Q130 Technical Abilities **ENGLISH**

Which of the following is not a type of friction?

A. Gravitational friction ✓

B. Rolling friction

C. Static friction

D. Kinetic friction



Q131 Technical Abilities **ENGLISH**

What is the heat supplied to a Carnot engine that produces 100 kW of useful work at an efficiency of 35%?

A. 285.7 kW



B. 150 kW

C. 300 kW

D. 200 kW

Q132 Technical Abilities **ENGLISH**

A cylindrical steel rod with a diameter of 20 mm is subjected to a tensile load of 40 kN. The material has a yield strength of 450 MPa. Assuming the deformation remains within the elastic limit, calculate the factor of safety based on the ultimate tensile strength and the yield strength. If the modulus of elasticity of the steel is 200 GPa, determine the elongation of the rod over a length of 500 mm under this load. Which of the following options correctly represents the factor of safety based on yield strength and the elongation?

A. Factor of Safety (Yield) = 3.58, Elongation = 0.8 mm

B. Factor of Safety (Yield) = 2.25, Elongation = 0.5 mm

C. Factor of Safety (Yield) = 2.25, Elongation = 0.318 mm

D. Factor of Safety (Yield) = 3.58, Elongation = 0.318 mm

**Q133** Technical Abilities **ENGLISH**

The shape of the bending moment diagram for a cantilever beam subjected to a uniformly distributed load (UDL) over the whole length is ____.

A. Trapezoidal

B. Triangular

C. Parabolic



D. Rectangular

Q134 Technical Abilities **ENGLISH**

The point of contraflexure occurs where ____.

A. Bending moment changes sign



B. Shear force is zero

C. Load intensity is zero

D. Bending moment is maximum

Q135 Technical Abilities **ENGLISH**

In a two-stroke diesel engine, the exhaust gases are removed through:

A. Valves

B. Spark plug

C. Carburetor

D. Ports

**Q136** Technical Abilities **ENGLISH**

Which of the following pair of processes in the Otto cycle are both isentropic?

A. Heat addition and heat rejection processes

B. Expansion and heat addition processes

C. Compression and heat rejection processes

D. Compression and expansion processes

**Q137** Technical Abilities **ENGLISH**

In ABC analysis, the letter 'C' is designated to:

A. low valued items, smaller in number

B. low valued items, larger in number



C. high valued items, larger in number

D. high valued items, smaller in number

Q138 Technical Abilities **ENGLISH**

A company faces an annual demand of 10,000 units, a fixed ordering cost of ₹200 per order, and a holding cost of ₹4 per unit per year. What is the EOQ for this company?

A. The EOQ is 1000 units



B. The EOQ is 2240 units

C. The EOQ is 5000 units

D. The EOQ is 4000 units



Q139 Technical Abilities

MIG (मेटल इनर्ट गॅस) वेल्डिंगमध्ये प्रामुख्याने डायरेक्ट करंट (DC) का वापरला जातो?

- A. हे जाड पदार्थासाठी प्रभेदन कमी करते
- B. हे जलद वेल्डिंगसाठी स्पॅटर वाढवते
- C. हे एक स्थिर आर्क आणि सातत्यपूर्ण धातू हस्तांतरण प्रदान करते ✓
- D. हे वेल्ड करता येणाऱ्या धातूंच्या प्रकारांना मर्यादित करते

Q140 Technical Abilities ENGLISH

Which of the following properties is used as the basis for temperature measurement in constant volume thermometers?

- A. Enthalpy
- B. Volume
- C. Entropy
- D. Pressure ✓

Q141 Technical Abilities

स्टीलच्या उष्णता प्रक्रियेमध्ये कार्बोरायझिंगचा (carburizing) कालावधी अति-दीर्घ असल्यास कोणता दोष निर्माण होण्याची सर्वाधिक शक्यता असते?

- A. कोरमध्ये आंतरकणीय क्षरणाची सुरुवात होणे
- B. संपूर्ण भागात जाडसर पर्लाइट (coarse pearlite) निर्माण होणे
- C. पृष्ठभागावर अतिरिक्त रिटेन्ड ऑस्टेनाइट (retained austenite) तयार होणे ✓
- D. संपूर्ण घटकामध्ये सख्खिद्रता वाढणे

Q142 Technical Abilities ENGLISH

For shafts designed to transmit the same torque, which statement is generally true when comparing a solid shaft to a hollow shaft of the same material and outer diameter?

- A. Both shafts have equal torsional stiffness and equal weight.
- B. The hollow shaft has a higher torsional stiffness and higher weight.
- C. The hollow shaft has a lower torsional stiffness but lower weight.
- D. The solid shaft has a higher torsional stiffness and lower weight. ✓

Q143 Technical Abilities

रबर-आधारित कोटिंग्जचा कोणता गुणधर्म त्यांना औद्योगिक वातावरणात स्टीलच्या पाईप्सचे संरक्षण करण्यासाठी योग्य बनवतो?

- A. कोटिंग, पाईप्ससाठी उच्च पातळीची औष्णिक संवाहकता प्रदान करते.
- B. कोटिंगमुळे पाईपच्या पृष्ठभागाची विद्युत वाहकता सुधारते.
- C. कोटिंगची लवचिकता कंपनांमुळे होणारे क्रॅकिंग टाळते आणि रासायनिक आघातांना रोखते. ✓
- D. दीर्घकाळ सूर्यप्रकाशाच्या संपर्कात राहूनही कोटिंगचा रंग टिकून राहतो.

Q144 Technical Abilities ENGLISH

What type of measurement does a 'comparator' work on?

- A. Basic measurement
- B. Relative measurement ✓
- C. Direct measurement
- D. Absolute measurement

Q145 Technical Abilities ENGLISH

Why does the vapor pressure of a liquid increase with an increase in temperature?

- A. Viscosity reduces exponentially
- B. Molecules gain kinetic energy to escape into vapor ✓
- C. Density reduces in a straight-line manner
- D. Surface tension remains constant



Q146 Technical Abilities

एक पोकळ शाफ्ट **40000 N-m** इतके टॉर्क संक्रमित करण्यासाठी डिझाइन केला आहे. त्याचा पोलर मोमेंट ऑफ इनर्शिया (J) **0.004 m⁴** आहे. या पोकळ शाफ्टच्या आतील व्यास आणि बाहेरील व्यास यांचे गुणोत्तर (D_i/D_o) हे **0.8** इतके आहे आणि आतील व्यास **400 mm** आहे. शाफ्टच्या बाहेरील पृष्ठभागावर (outer fiber) निर्माण होणारा जास्तीत जास्त कर्तन प्रतिबल (τ_{max}) किती असेल?

A. 2500 MPa

B. 250 MPa

C. 0.25 MPa

D. 2.5 MPa

**Q147** Technical Abilities **ENGLISH**

For a small spherical droplet of liquid with surface tension σ and diameter d , which of the following correctly expresses the pressure intensity inside the droplet p due to surface tension?

A. $p = \frac{2\sigma}{d}$

B. $p = \frac{\sigma}{d}$

C. $p = \frac{4\sigma}{d}$



D. $p = \frac{6\sigma}{d}$

Q148 Technical Abilities **ENGLISH**

The maximum bending moment for a simply supported beam of span L with uniformly distributed load (UDL) w per unit length is ____.

A. $\frac{WL^2}{8}$



B. $\frac{WL^2}{2}$

C. $\frac{WL^2}{16}$

D. $\frac{WL^2}{12}$



Q149 Technical Abilities **ENGLISH**

A hollow shaft has an outer diameter twice its inner diameter of a solid shaft, both constructed from the same material, and having identical outer diameters. The ratio of their torsional strength is:

A. $\frac{13}{14}$

B. $\frac{5}{9}$

C. $\frac{2}{3}$

D. $\frac{15}{16}$

**Q150** Technical Abilities

एक सेंट्रीफ्यूगल पंप, एकूण हेड $H = 25 \text{ m}$ च्या विरुद्ध $Q = 0.1 \text{ m}^3/\text{s}$ या दराने पाणी पुरवण्यासाठी डिझाइन केलेला आहे. जर पंपाची एकूण कार्यक्षमता (overall efficiency) $\eta = 75\%$ असेल, तर पंप चालवण्यासाठी अंदाजे किती पॉवर इनपुट आवश्यक आहे? (पाण्याची घनता $\rho = 1000 \text{ kg/m}^3$ आणि गुरुत्वाकर्षणामुळे मिळणारे त्वरण $g = 9.81 \text{ m/s}^2$ आहे असे गृहीत धरा.)

A. 24.5 kW

B. 58.1 kW

C. 32.7 kW

D. 43.6 kW

