



RRB JE 2024 CBT-2 Mechanical

Junior Engineer · Mechanical Engineering · CEN 03/2024 · CBT-2 · Question Paper

English

All 3 Shifts (Sets) · Official Answer Key

About this Compilation

This booklet contains all **3 shift papers** of the **RRB JE 2024 CBT-2 (Mechanical Engineering)** examination in **English**, with the correct option marked as per the official answer key.

✓ Correct option (highlighted green)

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.

More from QMaths

Check your marks, normalized score and zone-wise rank free at rank.qmaths.in. Master English vocabulary with the **Blackbook** app.



Toppers' Choice, Blackbook of English Vocabulary, Now available in App format : DOWNLOAD NOW

Index — All Sets (click to open)

Set 1

22 Apr 2025
9:00 AM - 11:00 AM

Set 3

04 Jun 2025
9:00 AM - 11:00 AM

Set 2

22 Apr 2025
2:30 PM - 4:30 PM

General Abilities

50 Questions • Answer Key

Q1 General Abilities

What is the approximate pH of a neutral salt solution?

- A. More than 7
- B. Less than 7
- C. Depends on the temperature
- D. Equal to 7



Q2 General Abilities

Which of the following CANNOT be considered as a measure to control global warming?

- A. Cutting down use of fossil fuel
- B. Efficiently using energy
- C. Reduction in emission of greenhouse gases
- D. Causing deforestation



Q3 General Abilities

If you want the primary recipient to see that others have received a copy of an email, you should enter their email addresses in the _____ field.

- A. To
- B. Subject
- C. Bcc
- D. Cc



Q4 General Abilities

What does PCB stand for?

- A. Processing Circuit Board
- B. Peripheral Connection Bus
- C. Printed Circuit Board
- D. Primary Control Board



Q5 General Abilities

Inertia depends on which property of an object?

- A. Velocity
- B. Shape
- C. Acceleration
- D. Mass



Q6 General Abilities

The primary agent that helps in the decomposition of biodegradable matter in domestic sewage is _____.

- A. chloride
- B. nitrate
- C. bacterium
- D. phosphate



Q7 General Abilities

What was the main objective of the Extremists during the Indian National Movement?

- A. To expand the legislative councils
- B. To bring social reforms
- C. To promote British goods in India
- D. To attain complete independence (Swaraj)



Q8 General Abilities

What is the maximum number of Ministers allowed in the Council of Ministers, including the Prime Minister, as per the 91st Amendment Act?

- A. 15% of Lok Sabha strength
- B. 10% of Lok Sabha strength
- C. 12% of Lok Sabha strength
- D. 20% of Lok Sabha strength



Q9 General Abilities

If the absolute refractive index of a medium is less than 1, it means _____.

- A. light travels slower in that medium than in vacuum
- B. the medium is a perfect reflector
- C. the medium absorbs all light
- D. light travels faster in that medium than in vacuum



Q10 General Abilities

The practice of Jhum cultivation is prevalent in the _____.

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



Q11 General Abilities

According to the Tendulkar methodology, what was the estimated percentage of people below the poverty line in rural areas in 2011-12?

- A. 27.5%
- B. 20%
- C. 15.5%
- D. 25.7%

**Q12 General Abilities**

Which of the following correctly explains why clothes dry faster on a windy day?

- A. Wind reduces the surface area of the clothes.
- B. Wind removes the water vapour from the clothes' surroundings.
- C. Wind decreases the temperature of the water molecules.
- D. Wind increases the humidity around the clothes.

**Q13 General Abilities**

What is the net force acting on an object if balanced forces are applied?

- A. Equal to the mass of the object
- B. Infinite
- C. Equal to acceleration
- D. Zero

**Q14 General Abilities**

What is the purpose of the Collation option in the Print settings?

- A. To adjust the page orientation
- B. To select a custom print range
- C. To print all the pages of a document as a set
- D. To change the printer selection

**Q15 General Abilities**

Why does a bee sting cause pain and irritation?

- A. The sting injects a mild sugar solution.
- B. The sting contains a strong base.
- C. The sting injects methanoic acid.
- D. The sting releases carbon dioxide gas.

**Q16 General Abilities**

Which state of matter shows the highest expansion when temperature is increased?

- A. Plasma
- B. Gases
- C. Solids
- D. Liquids

**Q17 General Abilities**

In which of the following regions the Himalayas has the greatest width?

- A. Kashmir
- B. Sikkim
- C. Arunachal Pradesh
- D. Himachal Pradesh

**Q18 General Abilities**

Which of the following is NOT a component of a CPU?

- A. Cache Memory
- B. Control Unit (CU)
- C. Arithmetic Logic Unit (ALU)
- D. Hard Disk

**Q19 General Abilities**

Who among the following inaugurated the 38th National Games held in Dehradun in January 2025?

- A. Anurag Thakur
- B. Pushkar Singh Dhami
- C. Droupadi Murmu
- D. Narendra Modi

**Q20 General Abilities**

What is the primary function of the F4 key in MS Excel when editing a cell reference in a formula?

- A. Repeats the last action
- B. Opens the Find and Replace dialog
- C. Refreshes the worksheet
- D. Toggles between absolute and relative references



Q21 General Abilities

Which of the following is NOT toxic to non-target organisms in the soil?

A. Organic fertilisers



B. Herbicides

C. Pesticides

D. Fungicides

Q22 General Abilities

What happens when a computer is put into Sleep mode?

A. It keeps the session active in RAM while using minimal power.



B. It shuts down completely.

C. It stores data on the hard drive and powers off.

D. It restarts automatically after a few minutes.

Q23 General Abilities

Which defect of vision occurs due to the weakening of ciliary muscles with age?

A. Hypermetropia

B. Myopia

C. Presbyopia



D. Astigmatism

Q24 General Abilities

What happens when an acid reacts with a metal oxide?

A. A salt and hydrogen gas are formed.

B. Only salt is formed.

C. Only water is formed.

D. A salt and water are formed.

**Q25 General Abilities**

Which official in the Gupta administration was responsible for peace and war matters?

A. Mahapratihara

B. Mahadandanayaka

C. Sandhi-Vigrahika



D. Vishayapati

Q26 General Abilities

Which of the following correctly represents the chemical formula of a compound formed by aluminium and sulphate ions?

A. $\text{Al}_2(\text{SO}_4)_3$



B. $\text{Al}_3(\text{SO}_4)_2$

C. Al_2SO_4

D. $\text{Al}(\text{SO}_4)_3$

Q27 General Abilities

What is the shortcut key to start a slideshow from the beginning?

A. Ctrl + P

B. Shift + F5

C. F5



D. Alt + Tab

Q28 General Abilities

Which of the following is a characteristic difference between colloids and true solutions?

A. True solutions show the Tyndall effect, but colloids do not.

B. True solutions exhibit Brownian motion, but colloids do not.

C. True solutions have a single-phase system, whereas colloids have a two-phase system.



D. True solutions have visible solute particles, whereas colloids have invisible dispersed particles.

Q29 General Abilities

The main use of chlorofluorocarbons is in _____.

A. vehicles

B. refrigerants



C. smog

D. chimneys

Q30 General Abilities

The Industrial Policy Resolution of 1956 categorised industries into how many groups?

A. Nine

B. Seven

C. Three



D. Five



Q31 General Abilities

The energy that is derived from the use of radioactive isotopes is termed as _____.

- A. geothermal energy
- B. nuclear energy ✓
- C. thermal energy
- D. solar energy

Q32 General Abilities

In an electric circuit, what is the correct way to connect an ammeter?

- A. In parallel with the component
- B. In either series or parallel
- C. In series with the component ✓
- D. In parallel with the source

Q33 General Abilities

The fine powder that is obtained from the modified and recycled form of plastic is called _____.

- A. polyethylene
- B. polyblend ✓
- C. polythene
- D. polystyrene

Q34 General Abilities

If an object is dropped from rest, what will be its velocity after 15 seconds? ($g = 9.8 \text{ m/s}^2$)

- A. 147 m/s ✓
- B. 149 m/s
- C. 145 m/s
- D. 143 m/s

Q35 General Abilities

Identify the correct formula for the compound formed between Mg^{2+} and PO_4^{3-} ions.

- A. $\text{Mg}_2(\text{PO}_4)_3$
- B. MgPO_4
- C. $\text{Mg}(\text{PO}_4)_3$
- D. $\text{Mg}_3(\text{PO}_4)_2$ ✓

Q36 General Abilities

The glass panel used in greenhouses is known to retain _____.

- A. rainfall
- B. heat ✓
- C. pH
- D. humidity

Q37 General Abilities

Dr. BR Ambedkar described which part of the Indian Constitution as its 'novel features', while Granville Austin referred to it as the 'Conscience of the Constitution'?

- A. Preamble
- B. Directive Principles of State Policy ✓
- C. Fundamental Duties
- D. Fundamental Rights

Q38 General Abilities

Which of the following cities hosted the inaugural Kho Kho World Cup in January 2025?

- A. Chennai
- B. New Delhi ✓
- C. Kolkata
- D. Mumbai

Q39 General Abilities

The Millennium Development Goals (MDGs) aimed to reduce extreme poverty by which year?

- A. 2014
- B. 2008
- C. 2005
- D. 2015 ✓

Q40 General Abilities

Which of the following is NOT a source of release of smokestacks?

- A. Thermal power plants
- B. Smelters
- C. Rivers ✓
- D. Industries



Q41 General Abilities

The Rudra Veena is predominantly associated with which genre of Hindustani music?

- A. Ghazal
- B. Thumri
- C. Khayal
- D. Dhrupad

**Q42 General Abilities**

Which Article provides Ministers the right to participate in parliamentary proceedings but without voting rights?

- A. Article 53
- B. Article 77
- C. Article 78
- D. Article 88

**Q43 General Abilities**

The maximum sound is generated _____.

- A. from vehicular emissions
- B. from house chimneys
- C. from industrial smoke
- D. by the take off of a jet plane

**Q44 General Abilities**

What is the first step to securing ones smartphone or tablet?

- A. Installing more apps
- B. Using only free Wi-Fi networks
- C. Turning off mobile data
- D. Setting a password/PIN-protected lock screen

**Q45 General Abilities**

What is India's global military ranking in the 2025 Global Firepower (GFP) index?

- A. 5th
- B. 4th
- C. 3rd
- D. 2nd

**Q46 General Abilities**

Which of the following states is NOT covered under the Atal Bhujal Yojana?

- A. Uttar Pradesh
- B. Maharashtra
- C. Rajasthan
- D. Jharkhand

**Q47 General Abilities**

Which of the following companies announced plans in February 2025 to construct the world's longest undersea cable, aiming to enhance internet connectivity across five continents, with landing points in India?

- A. Google
- B. Microsoft
- C. Amazon
- D. Meta

**Q48 General Abilities**

The phenomenon of multiple echoes due to repeated reflections is called _____.

- A. refraction
- B. diffraction
- C. reverberation
- D. resonance

**Q49 General Abilities**

What is the primary purpose of using a firewall on a Personal Computer?

- A. To block unauthorised access and protect the computer
- B. To speed up internet connectivity
- C. To increase storage space
- D. To clean up temporary files

**Q50 General Abilities**

Which of the following is the correct way to insert a new column in a spreadsheet?

- A. Go to File > New > Column.
- B. Use Ctrl + Z to insert a column.
- C. Press Ctrl + X and then Insert.
- D. Go to Home > Insert > Insert Sheet Columns.



Q51 Technical Abilities

Specific volume of a fluid is the reciprocal of its ____.

- A. mass density ✓
- B. dynamic viscosity
- C. viscosity
- D. surface tension

Q52 Technical Abilities

Which of the following is a key advantage of CNC lathes in turning operations?

- A. They are less accurate than conventional chucking machines.
- B. They rely mainly on mechanical devices for control.
- C. They provide higher automation and complex machining cycles. ✓
- D. They are limited to simple machining operations.

Q53 Technical Abilities

Pressure head in a fluid system is best described as:

- A. the kinetic energy per unit weight of the fluid
- B. the rate of fluid flow per unit cross-sectional area
- C. the height of a fluid column equivalent to the pressure exerted by the fluid ✓
- D. the difference between absolute and gauge pressure

Q54 Technical Abilities

The work done by the load in stretching the bar is known as:

- A. Dislocation Energy
- B. Potential Energy
- C. Strain Energy ✓
- D. Kinetic Energy

Q55 Technical Abilities

How is thermal efficiency defined in the context of internal combustion engines?

- A. The ratio of indicated power to frictional power losses
- B. The ratio of useful work output to the total chemical energy input from fuel ✓
- C. The ratio of exhaust gas temperature to the intake air temperature
- D. The ratio of the engine displacement to the fuel mass used

Q56 Technical Abilities

For a closed system undergoing a thermodynamic cycle, the first law states which of the following?

- A. Pressure and temperature are inversely related.
- B. Net work done equals net heat transfer. ✓
- C. Entropy always increases.
- D. Internal energy remains constant.

Q57 Technical Abilities

In a four-stroke cycle diesel engine, the intake valve starts to open at ____.

- A. 25° - 40° after BDC
- B. 25° - 40° before BDC ✓
- C. 10° - 15° after TDC
- D. 10° - 25° before TDC

Q58 Technical Abilities

What does the Polygon Law of Forces describe?

- A. The method to find the resultant of multiple forces ✓
- B. The force required to balance a single force
- C. The interaction between two perpendicular forces
- D. The equilibrium condition of multiple forces

Q59 Technical Abilities

Which of the following assumptions is essential for applying Bernoulli's theorem?

- A. The flow is steady, incompressible and frictionless. ✓
- B. The flow is turbulent and rotational.
- C. The fluid is viscous and incompressible.
- D. The fluid has high compressibility.

Q60 Technical Abilities

In a profile projector, the magnified image of the workpiece is created by:

- A. mirrors
- B. projection lens ✓
- C. a Vernier micrometer
- D. condenser lens



Q61 Technical Abilities

In four-stroke diesel engine, which valves are closed during the expansion stroke?

- A. Both inlet and exhaust valves ✓
- B. Neither inlet valve nor exhaust valve
- C. Only the exhaust valve
- D. Only the inlet valve

Q62 Technical Abilities

The overall efficiency of a pump is calculated by comparing:

- A. the pump speed to the impeller diameter
- B. the manometric head to the fluid velocity
- C. the volumetric flow rate to the pump casing size
- D. the hydraulic power output to the mechanical power input ✓

Q63 Technical Abilities

What is the impact of effective preplanning on the economic efficiency of a manufacturing operation?

- A. Elimination of the need for any forecasting
- B. Increase in the complexity of the production process
- C. Prevention of the production of large uneconomic output ✓
- D. Focus on the design of jigs and tools

Q64 Technical Abilities

The vaned diffuser in a centrifugal pump serves to:

- A. reduce cavitation by increasing turbulence
- B. control the pump's rotational speed
- C. convert kinetic energy into pressure energy ✓
- D. accelerate the fluid

Q65 Technical Abilities

Identify the class A items as per the ABC analysis in inventory.

- A. The balance 65-75% account for 5-10% of the consumption
- B. The balance 65-75% account for 70-80% of the consumption
- C. 10-20% of the items account for 70-80% of the consumption ✓
- D. The next 15-25% account for 10-20% of the consumption

Q66 Technical Abilities

The key step in making a dimensional measurement using a tool maker's microscope is ____.

- A. changing the objective lens power
- B. adjusting the focus on the workpiece ✓
- C. viewing the magnified image
- D. aligning the cross-wires with the measurement points

Q67 Technical Abilities

For machining yellow metals and free-cutting steels, ____ is/are used as cutting fluids.

- A. water
- B. water soluble oils ✓
- C. insoluble oils
- D. germicides and water

Q68 Technical Abilities

While measuring surface texture, the part of the profilometer that makes contact with the workpiece surface is ____.

- A. an electrical pickup
- B. a recording unit
- C. a finely pointed stylus ✓
- D. a motorised mechanism

Q69 Technical Abilities

What is the number of divisions on the vernier scale of a Universal Bevel Protractor?

- A. 46
- B. 70
- C. 24 ✓
- D. 60

Q70 Technical Abilities

A cantilever beam with a span length of L m carries a uniform moment of intensity ' M ' N-m/m. Which of the following statements is correct?

- A. Shear force throughout the length will be $ML/2$.
- B. Shear force throughout the length will be ML .
- C. Shear force throughout the length will be M/L .
- D. Shear force throughout the length will be zero. ✓



Q71 Technical Abilities

What does the process of Principle of Arc welding involve?

- A. Creating flow of electric current in the air gap between the electrode and the workpiece to melt the metal** ✓
- B. Supplying oxygen and acetylene between the electrodes to melt the metal
- C. Creating a chemical reaction between the electrode and the workpiece to melt the metal
- D. Creating friction between the electrode and the workpiece to melt the metal

Q72 Technical Abilities

Which of the following is an example of forced convection?

- A. Warm air naturally rising from a hot surface
- B. Air blown over a car radiator by a fan** ✓
- C. Heat transfer through a stationary fluid layer
- D. Thermal energy transmitted by electromagnetic waves

Q73 Technical Abilities

Despite having the highest possible efficiency for Carnot cycle, it is not suitable for a practical engine using a gaseous working fluid as:

- A. the work output from the cycle is quite low
- B. it is impossible to achieve perfectly reversible processes** ✓
- C. the cycle requires very high pressures that are hard to manage
- D. it is easy to maintain isothermal processes in practice

Q74 Technical Abilities

The creep rate in a material increases when:

- A. the temperature is decreased
- B. stress is increased** ✓
- C. alloying elements are removed
- D. the material is stretched

Q75 Technical Abilities

In gas welding process, gas pressure regulators are employed for _____.

- A. igniting the welding torch
- B. reducing the pressure of acetylene and oxygen gas from the cylinders to working pressure** ✓
- C. mixing oxygen and acetylene thoroughly
- D. increasing the oxygen and acetylene mixture pressure

Q76 Technical Abilities

In which type of welding flame is oxygen proportion more compared to acetylene proportion?

- A. Oxidising welding flame** ✓
- B. Neutral welding flame
- C. Carburising welding flame
- D. Reducing welding flame

Q77 Technical Abilities

In a modern optical measuring microscope, the 'cross-wires' are:

- A. etched on glass within the eyepiece** ✓
- B. located on the objective lens
- C. located on the surface of the workpiece
- D. located on the XY stage

Q78 Technical Abilities

Class ___ items are those that are 30-40% of all inventory items, and account for 30-40% of the total rupee consumption volume of the inventory. These are important, but not critical, and do NOT pose sourcing difficulties.

- A. B** ✓
- B. C
- C. X
- D. A

Q79 Technical Abilities

Soldering is a ____ similar or dissimilar metals by heating them to a required temperature.

- A. method of boring
- B. method of joining** ✓
- C. method of cooling
- D. method of cutting

Q80 Technical Abilities

A symmetrical T-section has its flange horizontal on top. Its dimensions are: Flange: Width = 100 mm, thickness = 24 mm; Web: Height = 84 mm, thickness = 20 mm. Its moment of inertia about a vertical axis through its centroid parallel to the web is (in mm⁴):

- A. 384,0000
- B. 2056×10^3** ✓
- C. 451×10^4
- D. 431×10^4



Q81 Technical Abilities

What is a primary advantage of using an open impeller design?

- A. Improved efficiency due to reduced flow separation
- B. Easier inspection and cleaning compared to closed impellers ✓
- C. Complete elimination of cavitation risks
- D. Higher pressure generation compared to radial flow pumps

Q82 Technical Abilities

What is the primary function of the headstock in a lathe machine?

- A. To hold and rotate the workpiece at different speeds ✓
- B. To provide support for cutting tools during operation
- C. To control the movement of the carriage and tailstock
- D. To adjust the feed mechanism for thread-cutting

Q83 Technical Abilities

Inventory control begins with ____ analysis, a fundamental supply chain activity frequently performed by inventory controllers and materials managers.

- A. XYZ
- B. FSN
- C. ABC ✓
- D. VED

Q84 Technical Abilities

Which of the following is used in organic coating as catalysts that speed up the cure reaction?

- A. UV stabilisers
- B. Plasticisers
- C. Colloidal stabilisers
- D. Cure additives ✓

Q85 Technical Abilities

A simply supported beam with a span length of 4 m carries a uniform load of intensity 5 N/m throughout its length. What will the value of the maximum bending moment (in N-m) in the beam be?

- A. 20
- B. 4
- C. 0
- D. 10 ✓

Q86 Technical Abilities

Shielded Metal Arc Welding (SMAW) is also called _____.

- A. Gas Tungsten Arc Welding
- B. Manual Metal Arc Welding ✓
- C. Metal Inert Gas Welding
- D. Tungsten Inert Gas Welding

Q87 Technical Abilities

Two shafts, A and B, are of the same material. If the diameter of A is thrice the diameter of B, then the torque that can be transmitted by A will be:

- A. 16 times that of B
- B. 27 times that of B ✓
- C. 9 times that of B
- D. 64 times that of B

Q88 Technical Abilities

Which of the following movements of the grinding wheel is possible in a chucking-type internal grinder?

- A. Both rotational and reciprocating movement ✓
- B. Only rotational movement
- C. Only reciprocating movement
- D. Only vibrational movement

Q89 Technical Abilities

What is the typical behaviour of creep deformation in materials at very high temperatures (above 0.5 times the melting temperature)?

- A. Rapid deformation and fractures
- B. Deformation in material is negligible
- C. Material becomes more brittle and fails instantly
- D. Material exhibits significant plastic deformation ✓

Q90 Technical Abilities

Why is the concept of transmissibility of forces valid for a rigid body?

- A. Because internal forces in a rigid body do not exist
- B. Because forces always act in the direction of motion
- C. Because a rigid body always has an infinite number of forces acting on it
- D. Because a rigid body does not deform under applied forces ✓



Q91 Technical Abilities

What is the function of shielding gas in Gas Tungsten Arc Welding (GTAW)?

- ☒ **A.** Protects the tungsten electrode and the molten metal weld pool from the atmospheric contamination
- ☐ **B.** Protects the consumable bare electrode and the molten metal weld pool from the atmospheric contamination
- ☐ **C.** Removes the slag by striking and conducts current to pass through it
- ☐ **D.** Protects the consumable coated electrode and the molten metal weld pool from the atmospheric contamination

Q92 Technical Abilities

Which type of steel would be best suited for applications requiring both high strength and good corrosion resistance?

- ☒ **A.** Stainless steel
- ☐ **B.** Mild steel
- ☐ **C.** High-carbon steel
- ☐ **D.** Low-alloy steel

Q93 Technical Abilities

In a two-stroke petrol engine, which of the following best describes the sequence of events during an exhaust stroke?

- ☐ **A.** Both ports open simultaneously.
- ☐ **B.** The exhaust port opens and closes before the transfer port opens.
- ☒ **C.** The exhaust port opens first, followed by the transfer port.
- ☐ **D.** The transfer port opens first, followed by the exhaust port.

Q94 Technical Abilities

Brazing is a process of ____ metals without melting the base metal.

- ☐ **A.** drilling
- ☐ **B.** melting
- ☒ **C.** joining
- ☐ **D.** cutting

Q95 Technical Abilities

In drilling operations, a coolant is used to ____.

- ☒ **A.** cool down the drill bit
- ☐ **B.** clean the drill bit
- ☐ **C.** heat the drill bit
- ☐ **D.** reduce durability of drill bit

Q96 Technical Abilities

Which cooling method is used in full annealing?

- ☒ **A.** Slow cooling inside a furnace
- ☐ **B.** Air cooling
- ☐ **C.** Cooling in an oil bath
- ☐ **D.** Quenching in water

Q97 Technical Abilities

Which of the following is the correct sequence for the IS specification of any Grinding wheel?

- ☐ **A.** Abrasive used - Grit number - Structure - Grade - Bond Type
- ☐ **B.** Abrasive used - Structure - Grade - Grit number - Bond Type
- ☐ **C.** Abrasive used - Grade - Structure - Grit number - Bond Type
- ☒ **D.** Abrasive used - Grit number - Grade - Structure - Bond Type

Q98 Technical Abilities

Which of the following is considered a primary output report from Material Requirements Planning?

- ☐ **A.** Performance control reports
- ☐ **B.** Exception reports
- ☐ **C.** Planning reports
- ☒ **D.** Planned order schedule

Q99 Technical Abilities

Relative efficiency of an engine is defined as the ratio of:

- ☐ **A.** actual thermal efficiency to Carnot efficiency
- ☐ **B.** mechanical efficiency to volumetric efficiency
- ☒ **C.** actual thermal efficiency to air-standard efficiency
- ☐ **D.** brake thermal efficiency to indicated thermal efficiency



Q100 Technical Abilities

_____ is/are the most widely used material for the broaches in a broaching operation.

- A. Copper
- B. High speed steel** ✓
- C. Silver-copper combination
- D. Metal matrix composites

Q101 Technical Abilities

Which area under the stress-strain curve represents the toughness of a material?

- A. Slope of the elastic region
- B. Area of elastic region
- C. Total area under the curve** ✓
- D. Area of plastic region

Q102 Technical Abilities

Which of the following is NOT a mechanical finishing process?

- A. Buffing
- B. Shot peening
- C. Burnishing
- D. Pickling** ✓

Q103 Technical Abilities

Which of the following does NOT belong to assumptions in calculating EOQ in the basic inventory model?

- A. Delivery of all items are instantaneous
- B. Material cannot be supplied in variable quantities** ✓
- C. Demand is continuous
- D. Lead time is constant

Q104 Technical Abilities

The main objective of the sequencing problem in production is to:

- A. maximise the number of jobs processed
- B. increase the processing time of jobs
- C. ignore the order of job processing
- D. minimise the idle time of machines** ✓

Q105 Technical Abilities

Impact strength is usually measured in units of:

- A. Pascals
- B. Watts
- C. Joules** ✓
- D. Newtons

Q106 Technical Abilities

Which of the following expressions can determine the longitudinal feed rate in "Through Feed Centreless Grinding"?

(If the diameter of the regulating wheel = D, r.p.m. of the regulating wheel = N, angle of inclination of the regulating wheel = θ)

- A. Longitudinal feed rate = $\pi \times D \times N \times \cos(\theta)$
- B. Longitudinal feed rate = $\pi \times D \times N \times \sin(\theta)$** ✓
- C. Longitudinal feed rate = $[\pi \times D \times N] / \sin(\theta)$
- D. Longitudinal feed rate = $[\pi \times D \times N] / \cos(\theta)$

Q107 Technical Abilities

What distinguishes a semi-open impeller from an open impeller?

- A. A semi-open impeller lacks any vanes.
- B. A semi-open impeller is completely enclosed by a casing.
- C. A semi-open impeller has a partial shroud on one side.** ✓
- D. A semi-open impeller has vanes on both sides.

Q108 Technical Abilities

Which of the following hardness scales uses a diamond cone indenter?

- A. Brinell scale
- B. Mohs scale
- C. Rockwell C scale** ✓
- D. Vickers scale

Q109 Technical Abilities

Which of the following is the correct rule when selecting a Grinding Wheel?

- A. Hard wheel for hard metal and soft wheel for soft metal
- B. Fine finish needs open structure
- C. Soft wheel for hard metal and hard wheel for soft metal** ✓
- D. Close structure for ductile and soft material



Q110 Technical Abilities

What will be the value of the maximum absolute shear stress produced in a thin cylinder if hoop stress = 40 MPa and longitudinal stress = 20 MPa?

- A. 60 MPa
- B. 10 MPa
- C. 20 MPa
- D. 30 MPa

**Q111 Technical Abilities**

Intensity of radiation varies with the:

- A. square of the distance
- B. fourth power of the distance
- C. cube of the distance
- D. inverse square of the distance

**Q112 Technical Abilities**

The sensing element in the Tomlinson Surface Meter is _____.

- A. the stylus
- B. rollers
- C. springs
- D. the shoe

**Q113 Technical Abilities**

Identify the milling cutter used for parting off operations or cutting thin slots.

- A. Angle milling cutter
- B. Plain milling cutter
- C. Metal slitting cutter
- D. Fly milling cutter

**Q114 Technical Abilities**

Which of the following is the function of hose pipes in the gas welding process?

- A. Mixes oxygen and acetylene in the correct proportion
- B. Removes the oxide film and maintains a clean surface
- C. Supplies the gases from the pressure regulators
- D. Protects the eyes from harmful heat and ultraviolet rays

**Q115 Technical Abilities**

Which of the following best describes the strength of mild steel compared to alloy steel?

- A. Mild steel generally has higher strength than alloy steel.
- B. Mild steel is stronger in compression but weaker in tension than alloy steel.
- C. Alloy steel generally has higher strength than mild steel.
- D. Both mild steel and alloy steel have the same strength.

**Q116 Technical Abilities**

If torsional rigidity increases in the torsion equation, then the:

- A. angle of twist remains constant
- B. angle of twist first increases then decreases
- C. angle of twist increases
- D. angle of twist decreases

**Q117 Technical Abilities**

Given an annual usage value of 400 units, the procurement cost is ₹20 per order, cost per piece is ₹100 and cost of carrying inventory is 10%. Calculate the EOQ.

- A. 30
- B. 40
- C. 50
- D. 60

**Q118 Technical Abilities**

In a dry sump lubrication system, how is oil returned to the storage tank?

- A. Gravity drains oil directly to the crankcase.
- B. Oil remains in the engine block indefinitely.
- C. A scavenge pump actively pumps oil back.
- D. Centrifugal force separates oil from air.

**Q119 Technical Abilities**

What should be the included angle of the cutting tool used for machining metric threads in a thread-cutting operation?

- A. 45 degrees
- B. 75 degrees
- C. 60 degrees
- D. 55 degrees



Q120 Technical Abilities

According to the Principle of Resolution, the algebraic sum of the resolved parts of multiple forces in a given direction is equal to:

- A. the sum of all forces acting in that direction
- B. the total magnitude of all forces combined
- C. the resolved part of their resultant in the same direction ✓
- D. the difference between the largest and smallest force

Q121 Technical Abilities

It is important for the piston to fit 'snugly' into the cylinder to:

- A. both, allow for easy movement and provide a gas-tight space ✓
- B. allow for easy movement alone
- C. provide a gas-tight space alone
- D. neither allow for easy movement nor provide a gas-tight space

Q122 Technical Abilities

In a battery or coil ignition system, what is the role of the ignition coil?

- A. To compress the air entering the combustion chamber
- B. To control the engine's exhaust temperature
- C. To regulate the fuel injection timing
- D. To transform the low battery voltage into a high voltage required for spark generation ✓

Q123 Technical Abilities

Atmospheric pressure is:

- A. the pressure difference between two fluids
- B. the pressure exerted by the Earth's atmosphere at any given point ✓
- C. the pressure inside a fluid container
- D. the pressure of a vacuum

Q124 Technical Abilities

In Submerged Arc Welding, _____ electrode is used in combination with a flux feeder tube.

- A. non-consumable graphite
- B. consumable bare ✓
- C. non-consumable tungsten
- D. non-consumable baked carbon

Q125 Technical Abilities

A bench mounted drilling machine is of the same type as a _____.

- A. sensitive drilling machine ✓
- B. deep hole drilling machine
- C. radial drilling machine
- D. gang drilling machine

Q126 Technical Abilities

The structured list of components and sub-assemblies needed to manufacture a final product is represented by the:

- A. components directory
- B. master file
- C. bill of materials ✓
- D. lead time

Q127 Technical Abilities

Which of the following is the primary element that supports the workpiece in centreless grinding?

- A. Work rest blade ✓
- B. Work test blade
- C. Pressure roller blade
- D. Stationary table

Q128 Technical Abilities

For a thin planar ring of radius 'r' mm and thickness 't' mm, its radius of gyration about the polar axis in mm is:

- A. $r/2$
- B. r/t
- C. r ✓
- D. $2r$

Q129 Technical Abilities

Which of the following does a cascade refrigeration system use?

- A. Only ammonia as a refrigerant
- B. A single refrigerant in both cycles
- C. Only air as a working fluid
- D. Two or more refrigerants with different boiling points ✓



Q130 Technical Abilities

If a pump's theoretical manometric head is 30 metres and its measured head is 27 metres, what is its manometric efficiency?

- A. 80%
- B. 90% ✓
- C. 75%
- D. 85%

Q131 Technical Abilities

What is the function of a shank in a broaching machine?

- A. Breaks up the chips generated during the broaching process
- B. Holds the broach in place and gives it a rotary motion
- C. Guides the broach through the material and maintains tool alignment ✓
- D. Removes chips and coolant from the cutting area

Q132 Technical Abilities

What is meant by the resolution of a force?

- A. Changing the direction of a force without altering magnitude
- B. Reducing the magnitude of a force in a given direction
- C. Splitting a force into components without changing its effect ✓
- D. Combining multiple forces to form a single resultant

Q133 Technical Abilities

One design advantage of a single volute casing is that:

- A. it minimises hydraulic losses by equalising pressure distribution
- B. it simplifies the manufacturing process ✓
- C. it allows for multiple impeller stages
- D. it provides balanced radial forces

Q134 Technical Abilities

The power required to drive a pump is calculated by considering:

- A. only the mechanical friction in the pump
- B. the pump's weight
- C. only the hydraulic power output
- D. the work done in overcoming hydraulic losses and delivering the desired head ✓

Q135 Technical Abilities

Why does cast iron have high compressive strength but low tensile strength?

- A. Due to its elastic properties
- B. Due to its ductile nature
- C. Due to its high malleability
- D. Due to the presence of graphite flakes ✓

Q136 Technical Abilities

In a 'spirit-level device', to which point of the glass vial does the bubble always move?

- A. Highest point ✓
- B. Random point
- C. Lowest point
- D. Middle point

Q137 Technical Abilities

Which of the following wheels supports the workpiece in internal centreless grinding operation?

- A. Only supporting roller
- B. Only regulating wheel
- C. Only pressure roller
- D. Pressure roller, supporting roller and regulating wheel ✓

Q138 Technical Abilities

What is the complete form of 'LVDT', one of the most popular electromechanical comparators?

- A. Linear variable dimensional transformer
- B. Longitudinal variable differential transformer
- C. Linear variable differential transformer ✓
- D. Linear versatile differential transformer

Q139 Technical Abilities

What defines a black body in the context of thermal radiation?

- A. An idealised object that absorbs all incident radiation and emits the maximum possible radiation at a given temperature ✓
- B. A surface that reflects all incident radiation without absorption
- C. A material that only emits visible light
- D. An object with perfect thermal insulation



Q140 Technical Abilities

The Vickers hardness number (VHN) for a material with a 20 kg load and an average indentation diagonal of 0.3 mm is:

- A. 78
- B. 115
- C. 324
- D. 412

**Q141 Technical Abilities**

What is the basic essential condition for coating material in hot dipping?

- A. It should have a higher melting point than the base metal.
- B. It should completely evaporate during the process.
- C. It should have lower wettability.
- D. It should form an alloy at the interface with the base metal.

**Q142 Technical Abilities**

Which welding process is NOT classified under arc welding processes?

- A. Atomic Hydrogen Welding
- B. Tungsten Inert Gas Welding
- C. Electroslag Welding
- D. Stud Arc Welding

**Q143 Technical Abilities**

Which of the following is NOT an angular measurement device?

- A. Digital Micrometer
- B. Spirit Level
- C. Sine Bar
- D. Autocollimator

**Q144 Technical Abilities**

Among the following, which beam can be classified as a statically indeterminate beam?

- A. Fixed beam
- B. Cantilever beam
- C. Simply supported beam
- D. Overhanging beam

**Q145 Technical Abilities**

In an air standard cycle, heat addition is assumed to occur

- A. through internal combustion of fuel
- B. from an external constant high-temperature source
- C. from a combination of chemical reactions and external sources
- D. by direct contact with a flame

**Q146 Technical Abilities**

In torch brazing, heat is produced by burning a mixture of

- A. oxy-acetylene gas
- B. oxy-neon gas
- C. oxy-nitrogen gas
- D. oxy-hydrogen gas



Q147 Technical Abilities

A symmetrical planar built-up section consists of two channel sections joined together at the tips of their flanges to form a closed rectangular area. The total width of each flange is 'B'. Each web is 'w' units deep inside, 'D' units deep at its outside (longer) face, and 'b' units thick. The moment of inertia of the composite section about its centroidal axis perpendicular to the webs is given by:

A. $\frac{BD^3}{12} - \frac{(B - b)w^3}{12}$

B. $\frac{BD^3}{6} - \frac{(B - b)w^3}{6}$ ✓

C. $\frac{BD^3}{12} - \frac{Bw^3}{3}$

D. $\frac{BD^3}{12} + \frac{(B - b)w^3}{3}$

Q148 Technical Abilities

A built-up section is made by joining two equal I-sections at the flanges at their outer faces so that the composite consists of one I-section above the other. The moment of inertia of each section through a centroidal axis parallel to the web is I_{yy} .

The moment of inertia of the composite built-up section about a similar axis is:

A. $4I_{yy}$

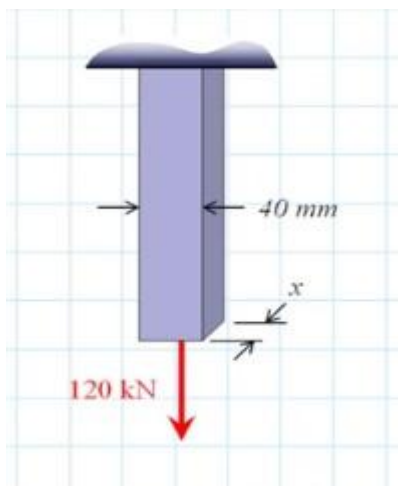
B. I_{yy}

C. $\frac{I_{yy}}{2}$

D. $2I_{yy}$ ✓

Q149 Technical Abilities

Determine the minimum thickness of the rectangular axial bar shown against yielding. Given Factor of Safety (FOS) = 2 and Yield stress = 310 MPa.



A. 60 mm

B. 19.4 mm ✓

C. 155 mm

D. 25 mm



Q150 Technical Abilities

If two forces act at a right angle (90°), what will be the magnitude of their resultant force?

A. $R = \sqrt{F_1^2 + F_2^2}$



B. $R = F_1 - F_2$

C. $R = F_1 + F_2$

D. $R = 2F_1F_2\cos\theta$



General Abilities

50 Questions • Answer Key

Q1 General Abilities

Which of the following elements has an atomic number of 8?

- A. Hydrogen
- B. Nitrogen
- C. Oxygen
- D. Carbon



Q2 General Abilities

The President has the power to dissolve which house of Parliament?

- A. Lok Sabha only
- B. Rajya Sabha only
- C. Legislative Assembly
- D. Both Rajya Sabha and Lok Sabha



Q3 General Abilities

Which of the following options is NOT a greenhouse gas?

- A. Methane
- B. Carbon dioxide
- C. Nitrous oxide
- D. Carbon tetrachloride



Q4 General Abilities

Radiations that are emitted from nuclear wastes are known to cause _____ at a high rate.

- A. syndromes
- B. mutations
- C. diseases
- D. emotional defects



Q5 General Abilities

An object is placed 15 cm in front of a convex lens of focal length 25 cm. The image distance will be _____.

- A. 17.5 cm
- B. -10.0 cm
- C. -9.37 cm
- D. -37.5 cm



Q6 General Abilities

Electricity production is categorised under which of the following economic sectors?

- A. Tertiary sector
- B. Quaternary sector
- C. Secondary sector
- D. Primary sector



Q7 General Abilities

The wavelength of ultraviolet radiations which is most powerful and causes damage to the DNA is _____.

- A. UV-C
- B. UV-B
- C. UV-D
- D. UV-A



Q8 General Abilities

What happens when you click on the 'Forward' button in an email?

- A. A blank email opens.
- B. The original message is copied into a new email draft.
- C. The email is automatically sent to all contacts.
- D. The email is permanently deleted.



Q9 General Abilities

In January 2025, India launched the NVS-02 satellite to strengthen which of the following navigation systems?

- A. Galileo
- B. Global Navigation Satellite System (GLONASS)
- C. Navigation with Indian Constellation (NavIC)
- D. Global Positioning System (GPS)



Q10 General Abilities

Who among the following developed the notation system for Hindustani classical music?

- A. Ustad Amjad Ali Khan
- B. Ustad Bismillah Khan
- C. Pandit Vishnu Narayan Bhatkhande
- D. Pandit Ravi Shankar



Q11 General Abilities

What is the general orientation of the Himalayan ranges in the northwestern part of India?

- A. East-South
- B. South-North
- C. Northwest to Southeast ✓
- D. Northeast to Southwest

Q12 General Abilities

A metal wire is stretched, but it does not break easily. This property is known as:

- A. brittleness
- B. ductility ✓
- C. malleability
- D. hardness

Q13 General Abilities

The power to issue an ordinance when Parliament is NOT in session is given to the President under which Article?

- A. Article 72
- B. Article 123 ✓
- C. Article 356
- D. Article 110

Q14 General Abilities

In an aquatic ecosystem, the phenomenon of biomagnification can best be studied in the case of _____.

- A. phosphates
- B. chlorine
- C. organochlorine
- D. DDT ✓

Q15 General Abilities

Which function key is used to move text or graphics in a document?

- A. F2 ✓
- B. F12
- C. F1
- D. F5

Q16 General Abilities

Which German optical technology firm inaugurated its first Global Capability Centre in Bengaluru in November 2024, with plans to double its workforce within three years?

- A. Leica
- B. Jenoptik
- C. Carl Zeiss AG ✓
- D. Schneider Kreuznach

Q17 General Abilities

Due to global warming, the temperature of the earth has increased by _____

- A. 0.8°C
- B. 0.7°C
- C. 0.5°C
- D. 0.6°C ✓

Q18 General Abilities

Who among the following established the Bengal Chemical Swadeshi Stores?

- A. Dadabhai Naoroji
- B. BG Tilak
- C. Surendranath Banerjee
- D. Acharya PC Ray ✓

Q19 General Abilities

Which of the following is NOT toxic to non-target organisms in the soil?

- A. Herbicides
- B. Fungicides
- C. Organic fertilisers ✓
- D. Pesticides

Q20 General Abilities

The kinetic energy of an object is derived using which of the following equations of motion?

- A. $v = u + at$
- B. $a = (v - u) / t$
- C. $v^2 - u^2 = 2as$ ✓
- D. $s = ut + \frac{1}{2}at^2$



Q21 General Abilities

Which formula should be entered in cell C2 to multiply the values of cells A2 and B2 in Excel?

A. =A2*B2



B. =MULTIPLY(A2,B2)

C. =A2-B2

D. =A2+B2

Q22 General Abilities

Which type of RAM is faster and DOES NOT require refreshing?

A. SRAM



B. Flash Memory

C. ROM

D. DRAM

Q23 General Abilities

Which of the following MS Excel functions is used to convert a numeric value into a text with a specific format?

A. NUMBERTOTEXT()

B. TEXT()



C. FORMAT()

D. VALUE()

Q24 General Abilities

Why do covalent compounds generally have low melting and boiling points?

A. They have strong electrostatic forces.

B. They contain metallic bonds.

C. They have a rigid lattice structure.

D. They have weak intermolecular forces.

**Q25 General Abilities**

Which of the following will increase the heat produced by a heating element?

A. Decreasing the applied voltage

B. Using a material with high conductivity

C. Using a wire of lower resistance

D. Increasing the current flowing through the wire

**Q26 General Abilities**

Which of the following was NOT an artisan guild during the Mauryan period?

A. Bankers and Merchants

B. Carpenters

C. Astrologers



D. Potters

Q27 General Abilities

The atomic mass of sulphur is 32 u, and sulphur exists as S₈ molecules. What is the molecular mass of sulphur?

A. 64 u

B. 256 u



C. 32 u

D. 128 u

Q28 General Abilities

Which of the following is NOT a source of collection of municipal solid waste?

A. Radioactive waste



B. Waste from schools

C. Waste from hospitals

D. Waste from homes

Q29 General Abilities

For the protection and improvement of the environmental quality, the Environment Protection Act came into force in the year _____.

A. 1972

B. 1984

C. 1992

D. 1986

**Q30 General Abilities**

A solution is prepared by dissolving 40 g of NaCl in 200 g of water. What is the mass per cent of NaCl in the solution?

A. 20%

B. 16.67%



C. 45%

D. 25%



Q31 General Abilities

Which of the following bridges is constructed over the Brahmaputra River in India?

- A. Mahatma Gandhi Setu
- B. Dhola-Sadiya Bridge ✓
- C. Howrah Bridge
- D. Pamban Bridge

Q32 General Abilities

A ball of mass 50 grams is moving with a velocity of 15 m/s. What is its kinetic energy?

- A. 7.500 J
- B. 3.750 J
- C. 1.875 J
- D. 5.625 J ✓

Q33 General Abilities

What is the primary function of a firewall tool in a computer network?

- A. To speed up internet connections
- B. To store data securely
- C. To monitor and control incoming and outgoing network traffic ✓
- D. To detect and remove viruses

Q34 General Abilities

What does LAN stand for?

- A. Limited Access Node
- B. Local Area Network ✓
- C. Linked Access Network
- D. Large Area Network

Q35 General Abilities

Who is known as the leader of the Green Revolution in India?

- A. Tribhuvandas Kishibhai Patel
- B. Dr. Rajendra Prasad
- C. C Subramaniam
- D. Prof. MS Swaminathan ✓

Q36 General Abilities

What is the primary function of a computer firewall?

- A. To speed up internet connectivity
- B. To store user passwords securely
- C. To prevent unauthorised access to a private network ✓
- D. To detect and remove computer viruses

Q37 General Abilities

Which of the following correctly differentiates mixtures and compounds?

Feature

- A. Option C (Properties) is correct
- B. Option B (Composition) is correct
- C. Option D (Formation) is correct
- D. Option A (Separation) is correct ✓

Q38 General Abilities

Which operating system is known for its open-source nature and community-driven development for desktops and laptops?

- A. iOS
- B. Windows
- C. Linux ✓
- D. macOS

Q39 General Abilities

A concave lens has a focal length of -2 cm. What is its power?

- A. -50 D ✓
- B. 0.5 D
- C. -0.5 D
- D. 25 D

Q40 General Abilities

A sound wave with a low frequency will have _____.

- A. a high pitch
- B. a low pitch ✓
- C. a short wavelength
- D. a low amplitude



Q41 General Abilities

In which of the following events did Deepthi Jeevanji set a world record at the 2024 World Para Athletics Championships?

- A. 200 metres T20
- B. 100 metres T20
- C. 600 metres T20
- D. 400 metres T20

**Q42 General Abilities**

Which country proposed the idea of holding a United Nations conference on human interactions with the environment in 1968?

- A. Canada
- B. Sweden
- C. United States
- D. France

**Q43 General Abilities**

Who among the following referred to the Directive Principles as the 'life-giving provisions' of the Constitution of India?

- A. LM Singhvi
- B. HM Seervai
- C. Ivor Jennings
- D. BR Ambedkar

**Q44 General Abilities**

A car moving at a constant speed of 123 km/hr along a straight road is an example of _____.

- A. non-uniform motion
- B. random motion
- C. rotational motion
- D. uniform motion

**Q45 General Abilities**

An alloy is considered a homogeneous mixture because:

- A. it contains two or more phases
- B. its components are chemically combined in fixed proportions
- C. its components can be separated by filtration
- D. it exhibits uniform composition throughout

**Q46 General Abilities**

Where can one find the option to change a PowerPoint template?

- A. View → Slide Master
- B. Insert → Themes
- C. Design → Themes
- D. Home → Layout

**Q47 General Abilities**

What happens to the pH of pure water when a few drops of lemon juice are added?

- A. The pH increases
- B. The pH becomes neutral
- C. The pH decreases
- D. The pH remains the same

**Q48 General Abilities**

Who among the following Indian female cricketers won the Best International Cricketer Award (Women) at the BCCI Naman Awards 2025?

- A. Smriti Mandhana
- B. Mithali Raj
- C. Jhulan Goswami
- D. Harmanpreet Kaur

**Q49 General Abilities**

The people of _____ were famously involved in execution of the Chipko movement.

- A. Assam
- B. Garhwal Himalayas
- C. Gujarat
- D. Delhi

**Q50 General Abilities**

The main reason for which we are dependent on air is our _____.

- A. digestion
- B. excretion
- C. respiration
- D. osmoregulation



Q51 Technical Abilities

Which of the following material has the highest compressive strength?

- A. Mild Steel
- B. Rubber
- C. Copper
- D. Cast Iron

**Q52 Technical Abilities**

In Arc Welding process, chipping hammer is used to _____.

- A. clean the surface to be welded
- B. protect the eyes
- C. remove the slag by striking
- D. hold the electrode manually and conducting current to it

**Q53 Technical Abilities**

Which of the following types of steel would NOT typically undergo the normalising process?

- A. Alloy steel
- B. Medium-carbon steel
- C. High-carbon steel
- D. Stainless steel

**Q54 Technical Abilities**

The primary purpose of a shadow projector is to ____.

- A. detect internal flaws in a material
- B. produce an undistorted magnified reflected image of an object
- C. analyse material composition
- D. measure surface roughness

**Q55 Technical Abilities**

What will be the nature of longitudinal stress in a thin closed cylinder containing hydrostatic fluid pressure?

- A. Shear
- B. Compressive
- C. Bending
- D. Tensile

**Q56 Technical Abilities**

Which type of light is generally used in the photo etching process?

- A. Infrared (IR) light
- B. Visible light
- C. X-ray
- D. Ultraviolet (UV) light

**Q57 Technical Abilities**

The Zeroth Law of Thermodynamics establishes the basis for which of the following?

- A. Measurement of temperature
- B. Entropy increase in isolated systems
- C. Conservation of energy
- D. Heat transfer through conduction

**Q58 Technical Abilities**

In which type of engine is a mist lubricating system most commonly used?

- A. Two-stroke petrol engines
- B. Gas turbine engines
- C. Four-stroke diesel engines
- D. Rotary engines

**Q59 Technical Abilities**

Which of the following is an operational function that comes under pre-planning?

- A. Loading
- B. Material planning and control
- C. Dispatching
- D. Forecasting

**Q60 Technical Abilities**

One challenge associated with double volute casings is:

- A. increased complexity in manufacturing and alignment
- B. decreased efficiency in converting kinetic to pressure energy
- C. higher risk of leakage due to multiple seams
- D. reduced flow rates



Q61 Technical Abilities

Which type of fracture is most likely to occur in a material with high tensile strength but low ductility?

- ☒ A. Brittle fracture
- ☐ B. Ductile fracture
- ☐ C. Fatigue failure
- ☐ D. Creep failure

Q62 Technical Abilities

Which of the following is a benefit of using Material Requirements Planning (MRP)?

- ☐ A. Increased raw material costs
- ☐ B. Slower response to market changes
- ☐ C. Reduced customer service and satisfaction
- ☒ D. Better inventory planning and scheduling

Q63 Technical Abilities

The S-N curve in fatigue testing shows the relationship between:

- ☐ A. stress and strain
- ☐ B. the number of cycles and strain amplitude
- ☐ C. stress and displacement
- ☒ D. the number of cycles and stress amplitude

Q64 Technical Abilities

Which of the following is the surface coating process?

- ☒ A. Hot dipping
- ☐ B. Tumbling
- ☐ C. Pickling
- ☐ D. Hot doping

Q65 Technical Abilities

What is the capability of a profilometer instrument?

- ☒ A. Measure roughness together with waviness and any other surface flaws
- ☐ B. Measure surface waviness only
- ☐ C. Measure surface flaws only
- ☐ D. Measure surface roughness only

Q66 Technical Abilities

Which alloying element in alloy steel is primarily responsible for enhancing corrosion resistance?

- ☐ A. Manganese
- ☐ B. Carbon
- ☒ C. Chromium
- ☐ D. Silicon

Q67 Technical Abilities

The primary reason for diesel engines having more efficiency than gasoline engines is they _____.

- ☒ A. have a higher compression ratio
- ☐ B. use a different fuel
- ☐ C. operate at higher temperatures
- ☐ D. have a longer stroke

Q68 Technical Abilities

In an ideal four-stroke petrol engine, the assumption made about the burning process during the power stroke i.e. after compression is:

- ☐ A. It starts at the bottom dead centre and continues as the piston moves up.
- ☒ B. It occurs instantaneously when the piston is at the top dead centre.
- ☐ C. It takes a significant amount of time.
- ☐ D. It is a gradual process that starts before the piston reaches top dead centre.

Q69 Technical Abilities

What will be the shape of the bending moment diagram for a cantilever beam carrying a uniformly distributed load throughout its length?

- ☐ A. A straight line
- ☐ B. Cubical
- ☐ C. A hyperbola
- ☒ D. A parabola

Q70 Technical Abilities

Which of the following is a common metrological application of interferometry?

- ☐ A. Measuring temperature
- ☒ B. Inspecting machine parts for straightness
- ☐ C. Analysing chemical composition
- ☐ D. Determining surface hardness



Q71 Technical Abilities

Which characteristic best describes an axial flow pump?

- A. The fluid flows parallel to the pump shaft. ✓
- B. The fluid flows perpendicular to the pump shaft.
- C. The fluid flow is converted to heat energy.
- D. The fluid flows radially outward from the shaft.

Q72 Technical Abilities

In carburising welding flame, there is a supply of _____ in the combustible mixture.

- A. only oxygen
- B. acetylene and oxygen in equal proportion
- C. more acetylene proportion and limited oxygen proportion ✓
- D. limited acetylene proportion and more oxygen proportion

Q73 Technical Abilities

The intake valve closes at _____ for a low-speed engine and at _____ for high-speed four-stroke petrol engines.

- A. 10 deg before BDC; 60 deg before BDC
- B. 60 deg before BDC; 10 deg before BDC
- C. 10 deg after BDC; 60 deg after BDC ✓
- D. 60 deg after BDC; 10 deg after BDC

Q74 Technical Abilities

If elastic strength increases 3 times, then Proof Resilience:

- A. decreases 3 times
- B. decreases 9 times
- C. increases 9 times ✓
- D. increases 3 times

Q75 Technical Abilities

Which of the following happens when two equal and opposite forces are applied at a point on a rigid body?

- A. They produce an additional force on the body.
- B. They cancel each other and have no effect. ✓
- C. They change the magnitude of the original force.
- D. They create rotational motion in the body.

Q76 Technical Abilities

Drill chuck is the major part of drilling machines, which _____.

- A. rests on the base and supports the head and the table
- B. holds electric motor, V-pulleys and V-belt
- C. holds the drill bit ✓
- D. transmits rotary motion to the drill spindle at a number of speeds

Q77 Technical Abilities

Angle gauges are generally made from which material?

- A. Carbon fibre
- B. Wood
- C. Hardened steel ✓
- D. Plastic

Q78 Technical Abilities

_____ type of electrode is used in Gas Tungsten Arc Welding (GTAW).

- A. Consumable bare
- B. Non-consumable carbon
- C. Non-consumable tungsten ✓
- D. Consumable coated

Q79 Technical Abilities

Priming of a pump refers to:

- A. adjusting the impeller clearance
- B. removing air from the pump casing and suction line ✓
- C. increasing the rotational speed of the pump
- D. lubricating the pump bearings

Q80 Technical Abilities

The type of lasers commonly used in laser interferometers for metrology applications are _____.

- A. gas lasers ✓
- B. dye lasers
- C. solid-state lasers
- D. excimer lasers



Q81 Technical Abilities

How many mirrors are used for magnification in the Zeiss Ultra-Optimeter?

- A. Four
- B. Two
- C. One
- D. Three

Q82 Technical Abilities

Which of the following is a special case of a spirit-level device?

- A. Autocollimator
- B. Kelvinometer
- C. Clinometer
- D. Micrometer

Q83 Technical Abilities

What is the primary function of the tool post in a lathe machine?

- A. To secure the workpiece firmly on the machine bed
- B. To hold and adjust the tool for a suitable working position
- C. To control the feed rate and depth of cut during machining
- D. To support the compound rest and provide rotational movement

Q84 Technical Abilities

The radius of gyration about the polar axis of a circular lamina of radius 0.2 m is:

- A. π cm
- B. 0.14 m
- C. 0.1 m
- D. 4.1 cm

Q85 Technical Abilities

If the external diameter of a hollow shaft is three times greater than its internal diameter, what is the ratio of its torque-carrying capacity compared to that of a solid shaft of identical material and the same outer diameter?

- A. 26/27
- B. 65/81
- C. 81/80
- D. 80/81

Q86 Technical Abilities

Which of the following processes produces the minimum surface roughness on workpieces?

- A. Superfinishing
- B. Lapping
- C. Honing
- D. Grinding

Q87 Technical Abilities

The Bell-Coleman cycle is also known as:

- A. Reversed Brayton cycle
- B. Rankine cycle
- C. Carnot cycle
- D. Brayton cycle

Q88 Technical Abilities

In Arc Welding Processes, GMAW stands for _____.

- A. Gas Metal Arc Welding
- B. Gas Molten Arc Welding
- C. Gang Metal Arc Welding
- D. Gas Molten Arbour Welding

Q89 Technical Abilities

Manometric head is defined as:

- A. the temperature difference across the pump
- B. the fluid velocity within the pump
- C. the weight of the pump
- D. the height of a fluid column corresponding to the pump's output pressure

Q90 Technical Abilities

What is the function of coolants in metal cutting or machining operation?

- A. Provides higher friction and wear between tool and workpiece
- B. Decreases adhesion between chip and tool
- C. Increases wear and tear of tools and decrease tool life
- D. Reduces machinability and machining forces



Q91 Technical Abilities

A beam with a symmetrical T section has a top flange 50 mm wide and 20 mm thick, and a web 40 mm high and 10 mm thick. An additional plate, 10 mm thick and 60 mm wide, is welded above the flange. The moment of inertia of this symmetrical planar cross-section about an axis in its plane normal to the web and in line with the upper face of the 10 mm thick plate works out to $1506,666.66 \text{ mm}^4$. The centroidal axis of the combined area is 21.5 mm below this axis, normal to the web. The moment of inertia of this built-up area about the centroidal axis is (in mm^4):

A. 5,82,166.66



B. 2,17,833.34

C. 1.33×10^5

D. 70,077.52

Q92 Technical Abilities

Which of the following represents the polar modulus of the hollow shaft?

[If D_o = External diameter and D_i = Internal diameter]

A. $[16\pi/D_o] [D_o^4 - D_i^4]$

B. $[16/\pi D_o] [D_o^4 - D_i^4]$

C. $[\pi/16 D_o] [D_o^3 - D_i^3]$

D. $[\pi/16 D_o] [D_o^4 - D_i^4]$

**Q93 Technical Abilities**

A pitot tube is primarily used to measure:

A. flow velocity



B. static pressure

C. dynamic pressure

D. atmospheric pressure

Q94 Technical Abilities

To machine an internal hole in a broaching operation, the broach is gripped by the ____.

A. puller at the face of the teeth

B. puller at the pilot



C. puller at the shank end

D. puller at the flute

Q95 Technical Abilities

In rack and pinion gear, the rack is a ____ and the pinion is a ____.

A. straight line gear; straight line gear

B. circular wheel; straight line gear

C. circular wheel; circular wheel

D. straight line gear; circular wheel

**Q96 Technical Abilities**

A pump discharges water with a manometric head of 20 m. If the density of water is 1000 kg/m^3 and gravity is 9.81 m/s^2 , what is the approximate pressure increase provided by the pump?

A. 2 kPa

B. 9.81 kPa

C. 196 kPa



D. 20 kPa

Q97 Technical Abilities

What does specific fuel consumption (SFC) measure in an internal combustion engine?

A. The efficiency of the engine's exhaust system

B. The total mass of the fuel used during engine operation

C. The ratio of air intake to fuel delivered per combustion cycle

D. The fuel efficiency expressed as the amount of fuel consumed per unit of power produced

**Q98 Technical Abilities**

What is the full form of 'CBN', which is used as an abrasive in grinding processes?

A. Copper boron nitride

B. Carbon boron nitrate

C. Calcium bi nitrous

D. Cubic boron nitride

**Q99 Technical Abilities**

In brazing, the filler metal is drawn into the joint by means of ____.

A. surface tension

B. capillary action



C. friction

D. damping action



Q100 Technical Abilities

What is the designated function of a 'planetary internal grinder machine'?

- A. For a very small work piece
- B. For a work piece of regular shape
- C. For a work piece of irregular shape ✓
- D. For low precision surface finishes

Q101 Technical Abilities

Frictional power in an engine is calculated as:

- A. Brake power / Mechanical efficiency
- B. Indicated power × Mechanical efficiency
- C. Indicated power + Brake power
- D. Indicated power – Brake power ✓

Q102 Technical Abilities

What is a characteristic of a coplanar parallel force system?

- A. Forces act in different planes and are parallel.
- B. Forces act in different planes and are not parallel.
- C. Forces act in the same plane and are parallel. ✓
- D. Forces act in the same plane but are not parallel.

Q103 Technical Abilities

Which of the following best defines vapour pressure in a liquid?

- A. The pressure exerted by the liquid molecules
- B. The pressure required to force the liquid into a capillary tube
- C. The pressure exerted by the vapour in equilibrium with its liquid at a given temperature ✓
- D. The difference between atmospheric pressure and absolute pressure

Q104 Technical Abilities

In the Charpy impact test, the specimen is typically:

- A. a rectangular bar with a notch in the middle ✓
- B. a sheet of material placed under compression
- C. a cylindrical rod with no defects
- D. subjected to a gradual tensile load

Q105 Technical Abilities

A symmetrical I-section has a moment of inertia about the centroidal axis in its plane perpendicular to the web, of $22.34 \times 10^4 \text{ mm}^4$. The moment of inertia of the full rectangular area occupied by the I-beam cross section about this axis is $65 \times 10^4 \text{ mm}^4$. The two empty spaces on either side of the web are square. What is the height of the web?

- A. 30 mm
- B. 55 mm
- C. 40 mm ✓
- D. 50 mm

Q106 Technical Abilities

Which of the following centre-less grinding can be preferred for headed, stepped, or taper-shaped workpieces?

- A. Plunge cut grinding ✓
- B. Taper out grinding
- C. Out feed grinding
- D. Rotation feed center-less grinding

Q107 Technical Abilities

Tungsten Inert Gas Welding (TIG) is also called _____.

- A. Gas Metal Arc Welding
- B. Metal Inert Gas Welding
- C. Gas Tungsten Arc Welding ✓
- D. Thermo-compression Welding

Q108 Technical Abilities

Which of the following is NOT a function of the spirit level measuring instrument?

- A. For measuring alignment of machine parts
- B. For measuring surface roughness ✓
- C. For measuring angles
- D. For determining flatness and straightness

Q109 Technical Abilities

In the _____ welding technique, the welding rod is applied before the welding torch in the direction of motion.

- A. laser
- B. forehand ✓
- C. electric arc
- D. backhand



Q110 Technical Abilities

Broaching of outside surfaces is called ____.

- A. surface broaching** ✓
- B. hallow broaching
- C. internal broaching
- D. hole broaching

Q111 Technical Abilities

Why does stainless steel resist rusting, while regular carbon steel does not?

- A. Stainless steel has higher carbon content which makes it corrosion resistant.
- B. Stainless steel is coated with a special anti-rust chemical.
- C. Stainless steel has a protective chromium oxide layer that prevents rusting.** ✓
- D. Stainless steel has a thicker iron content.

Q112 Technical Abilities

Slag inclusion is the welding defect caused by _____.

- A. incorrect edge penetration
- B. contamination of either the filler or parent metals
- C. gas being trapped, due to moisture
- D. insufficient cleaning and preparation of the base metal before welding commences** ✓

Q113 Technical Abilities

How does the volute shape in a single volute pump casing affect performance?

- A. It helps maintain a uniform flow distribution.** ✓
- B. It serves only an aesthetic purpose.
- C. It increases turbulence within the pump.
- D. It restricts the pump's operating range.

Q114 Technical Abilities

Which of the following is a limitation of taper turning by swiveling the compound rest?

- A. It cannot turn any type of taper.
- B. It provides high production efficiency.
- C. It is suitable only for short tapers.** ✓
- D. It ensures the best surface finish.

Q115 Technical Abilities

Compared to axial flow pumps, radial flow pumps typically:

- A. generate higher pressures with lower flow rates** ✓
- B. have lower efficiency in all applications
- C. are used exclusively for pumping gases
- D. produce higher flow rates at lower pressures

Q116 Technical Abilities

In which of the following situations would brittleness be most UNDESIRABLE?

- A. In materials exposed to high temperatures
- B. In materials used in high-speed applications
- C. In structural beams under static load
- D. In tools that need to withstand heavy impact** ✓

Q117 Technical Abilities

Which of the following options best describes non-coplanar concurrent forces?

- A. Forces that meet at one point but their lines of action do not lie on the same plane** ✓
- B. Forces that do not meet at one point and their lines of action lie on the same plane
- C. Forces that meet at one point and their lines of action lie on the same plane
- D. Forces that do not meet at one point but their lines of action lie on different planes

Q118 Technical Abilities

Which of the following materials is likely to have the highest thermal conductivity?

- A. Wood
- B. Air
- C. Aluminium** ✓
- D. Rubber

Q119 Technical Abilities

If a component has a Factor of Safety (FoS) of 1.0, what does it indicate?

- A. The design is highly conservative.
- B. The design is unsafe and should not be designed.
- C. The material will fail exactly at the expected load.** ✓
- D. The component will never fail irrespective of any load.



Q120 Technical Abilities

_____ is a welding defect caused by trapping of gas during the welding process.

- A. Burn through
- B. Cracking
- C. Undercut
- D. Porosity

**Q121 Technical Abilities**

The factor considered for wage determination in the flat day rate basic wage incentive plan is:

- A. company profit
- B. individual performance
- C. number of pieces produced
- D. hours worked

**Q122 Technical Abilities**

A gray body is defined as a body that:

- A. has an emissivity that varies with wavelength of radiation
- B. absorbs all radiation incident upon its surface
- C. has emissivity less than 1 but constant for all wavelengths
- D. reflects all radiation incident upon its surface

**Q123 Technical Abilities**

In the CPM technique, the critical path slack is:

- A. negative
- B. positive
- C. zero
- D. either negative or zero

**Q124 Technical Abilities**

According to Maslow's Hierarchy of Needs, the basic requirements of the human body such as food, water, sleep, etc. are categorised into:

- A. physiological needs
- B. social needs
- C. esteem needs
- D. self-actualisation needs

**Q125 Technical Abilities**

While measuring surface texture, the part of the profilometer that makes contact with the workpiece surface is:

- A. a motorised mechanism
- B. a recording unit
- C. a finely pointed stylus
- D. an electrical pickup

**Q126 Technical Abilities**

For a symmetrical T-section, the moment of inertia through centroidal axes in its plane parallel to the flange $I_{xx} = 2 \times 10^7 \text{ mm}^4$, and perpendicular to the flange is $I_{yy} = 1.5 \times 10^7 \text{ mm}^4$. The moment of inertia about the centroidal axis normal to the planar area works out to (in mm^4):

- A. 2.5×10^7
- B. 1.33×10^7
- C. 0.5×10^7
- D. 3.5×10^7

**Q127 Technical Abilities**

Which of the following beams is classified as a statically determinate beam?

- A. Propped cantilever beam
- B. Continuous beam
- C. Fixed beam
- D. Overhanging beam

**Q128 Technical Abilities**

In which type of oxy-acetylene welding flames are both acetylene and oxygen in equal proportions?

- A. Carburising welding flame
- B. Neutral welding flame
- C. Oxidising welding flame
- D. Reducing welding flame

**Q129 Technical Abilities**

In most of the SI engines, the intake valve opens a few degrees before the TDC on the exhaust stroke to:

- A. ensure complete combustion of the fuel-air mixture
- B. increase the engine's compression ratio
- C. allow for better scavenging of exhaust gases
- D. ensure that the intake valve is fully open when the piston reaches the TDC



Q130 Technical Abilities

What is the primary function of the tailstock in a lathe?

- A. To provide support and bearing for the rotating job ✓
- B. To control the speed of the spindle rotation
- C. To hold the cutting tool for machining operations
- D. To change the direction of the spindle movement

Q131 Technical Abilities

In Carbon Arc Welding, DCSP stands for _____.

- A. Direct current straight porosity
- B. Dual current straight polarity
- C. Direct current straight pressure
- D. Direct current straight polarity ✓

Q132 Technical Abilities

If the temperature of a black body doubles, how many times will its emissive power increase?

- A. 8 times
- B. 16 times ✓
- C. 2 times
- D. 4 times

Q133 Technical Abilities

The master production schedule represents the:

- A. financial requirements for the production
- B. starting and finishing time of different products ✓
- C. finishing time of component manufacturing
- D. starting time of component manufacturing

Q134 Technical Abilities

In a two-stroke petrol engine, the primary function of the crankcase is to:

- A. store lubricating oil
- B. house the transfer port
- C. cool the engine
- D. act as a primary pumping chamber for the air-fuel mixture ✓

Q135 Technical Abilities

An engine is assumed to be working on ideal Otto cycle with the temperatures at the beginning and end of compression as 27 °C and 327 °C. The air-standard efficiency of the engine is:

- A. 60%
- B. 50% ✓
- C. 78%
- D. 87%

Q136 Technical Abilities

A simply supported beam with a span length of 5 m carries a moment of 20 N-m (counterclockwise direction) at the middle of the beam. What will the value of reactions be at both the ends of the beam?

- A. 2 N, -2 N
- B. 8 N, -8 N
- C. 4 N, -4 N ✓
- D. 5 N, -5 N

Q137 Technical Abilities

Which statement best compares battery and magneto ignition systems in internal combustion engines?

- A. Magneto systems require more frequent maintenance than battery systems.
- B. Both systems depend on an external battery for operation.
- C. Battery ignition systems are independent of engine speed, unlike magneto systems.
- D. Battery ignition systems rely on stored electrical energy, whereas magneto systems generate power on-demand via electromagnetic induction. ✓

Q138 Technical Abilities

How does atmospheric pressure influence gauge pressure measurements?

- A. Gauge pressure equals atmospheric pressure minus absolute pressure.
- B. Gauge pressure is independent of atmospheric pressure.
- C. Gauge pressure is the difference between absolute pressure and atmospheric pressure. ✓
- D. Gauge pressure is the sum of absolute and atmospheric pressure.



Q139 Technical Abilities

A steel bar ($E = 200E = 200$, $\alpha = 12 \times 10^{-6}/^{\circ}\text{C}$) expands by 0.3 mm due to a temperature increase. If the original length of the bar was 15 cm, what was the temperature rise?

A. 166.6°C



B. 120.6°C

C. 180°C

D. 100°C

Q140 Technical Abilities

In climb milling, metal is removed by the cutter rotating in the ____.

A. perpendicular direction of the feed of the workpiece

B. diagonal direction of the feed of the workpiece

C. opposite direction of the feed of the workpiece

D. same direction of the feed of the workpiece

**Q141 Technical Abilities**

Electroplating is the opposite of which of the following?

A. Galvanic cell



B. Battery charging

C. Electrolysis

D. Fuel cell

Q142 Technical Abilities

The primary purpose of job rating or evaluation is to:

A. provide benefits like leave and housing

B. assess an employee's performance

C. motivate employees for higher production

D. determine the relative worth of different jobs

**Q143 Technical Abilities**

While scheduling decisions, the most influencing parameter is:

A. competitor pricing

B. availability of skilled personnel

C. market research

D. sales forecasting

**Q144 Technical Abilities**

Which of the following factors generally increases the brittleness of a material?

A. High alloy content

B. Low temperature



C. High temperature

D. High strain rate

Q145 Technical Abilities

Fluid pressure is defined as:

A. the rate of the flow of fluid through a given area

B. the force per unit area exerted by a fluid at rest



C. the force acting parallel to a surface

D. the weight of a fluid per unit volume

Q146 Technical Abilities

Which of the following are used to improve pigment dispersion and the stability of coatings during organic coating?

A. Curing stabilisers

B. Plasticisers

C. Pigment analyser

D. Colloidal stabilisers

**Q147 Technical Abilities**

Which of the following elements provides the necessary horizontal force to the workpiece in centerless grinding?

A. Regulating wheel



B. Work test blade

C. Revolving wheel

D. Stationary wheel



Q148 Technical Abilities

How is the resultant force calculated if two forces act along the same straight line but in opposite directions?

A. $R = F_1 - F_2$

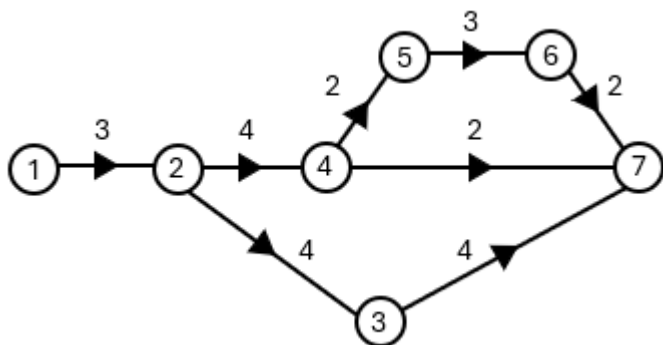
B. $R = 2F_1 F_2 \cos \theta$

C. $R = F_1 + F_2$

D. $R = \sqrt{F_1^2 + F_2^2}$

Q149 Technical Abilities

Identify the critical path from the given diagram.



A. 1-2-4-7

B. 1-2-4-5-6-7

C. 1-2-3-7

D. 1-2-4-5-6

Q150 Technical Abilities

When two equal forces F act at an angle θ , the resultant force is given by which of the following expressions?

A. $R = 2F \cos\left(\frac{\theta}{2}\right)$

B. $R = F_1 - F_2$

C. $R = F_1 + F_2$

D. $R = 2F \sin\left(\frac{\theta}{2}\right)$



General Abilities

50 Questions • Answer Key

Q1 General Abilities

The area termed as the ozone hole is known to mainly develop over _____.

A. Antartica



B. India

C. Africa

D. America

Q2 General Abilities

Which of the following economic estimators provided estimates of India's national and per capita income during the colonial period?

A. John Maynard Keynes

B. Adam Smith

C. VKRV Rao



D. Karl Marx

Q3 General Abilities

What is the typical range of a Local Area Network (LAN)?

A. More than 50 km

B. Up to 1 km



C. Up to 5 km

D. Up to 10 km

Q4 General Abilities

Which mouse pointer appears when adjusting column width / cell width in a table?

A. ↔ (Horizontal double-headed arrow)



B. I-beam (Text cursor)

C. ↑↓ (Vertical double-headed arrow)

D. Hand cursor

Q5 General Abilities

Which of the following is a zero waste procedure?

A. Integrated organic farming



B. Pest management

C. Organic farming

D. Inorganic farming

Q6 General Abilities

What is the primary goal of application security?

A. To increase the execution speed of applications

B. To protect applications from security threats by identifying and fixing vulnerabilities



C. To reduce the size of application files

D. To enhance the graphical user interface of applications

Q7 General Abilities

Which of the following is NOT an example of an agrochemical?

A. Fungicides

B. Biogas



C. Pesticides

D. Herbicides

Q8 General Abilities

What is the function of the Linux Shell?

A. To directly manage hardware resources

B. To execute user commands and act as an interface between the user and the kernel



C. To store user data

D. To create and delete partitions

Q9 General Abilities

The melting of snow and ice caps from the polar regions is responsible for _____.

A. the decline in sea levels

B. condensation

C. the rise in sea levels



D. rainfall

Q10 General Abilities

The Indian Desert lies towards the western margins of which mountain range?

A. Satpura Hills

B. Aravali Hills



C. Vindhya Hills

D. Western Ghats



Q11 General Abilities

Which of the following is an example of a chemical change?

- A. Tearing of paper
- B. Dissolution of sugar in water
- C. Freezing of water
- D. Curdling of milk

**Q12 General Abilities**

An object is placed 25 cm in front of a convex lens with a focal length of 15 cm. What is the magnification produced by the lens?

- A. $M = 2.5$
- B. $M = 1.5$
- C. $M = -2.5$
- D. $M = -1.5$

**Q13 General Abilities**

Which of the following is a string instrument?

- A. Shehnai
- B. Flute
- C. Tabla
- D. Sitar

**Q14 General Abilities**

The loss of forests, which is remarkably seen in the tropical areas of India, is around _____.

- A. 30%
- B. 40%
- C. 10%
- D. 20%

**Q15 General Abilities**

The Railways Employment of Members of the Armed Forces Act was passed in which of the following years?

- A. 1957
- B. 1965
- C. 1962
- D. 1951

**Q16 General Abilities**

Which of the following is an example of database management software?

- A. PowerPoint
- B. Notepad
- C. MS Paint
- D. Microsoft Access

**Q17 General Abilities**

Two objects of masses 80 kg and 250 kg are placed 200 m apart. What is the gravitational force between them? ($G = 6.7 \times 10^{-11} \text{ N}\cdot\text{m}^2/\text{kg}^2$)

- A. $5.75 \times 10^{-11} \text{ N}$
- B. $4.50 \times 10^{-11} \text{ N}$
- C. $3.35 \times 10^{-11} \text{ N}$
- D. $6.35 \times 10^{-11} \text{ N}$

**Q18 General Abilities**

The greenhouse gas that is known to contribute the least amount to global warming is _____.

- A. methane
- B. carbon dioxide
- C. CFCs
- D. nitrous oxide

**Q19 General Abilities**

_____ is the most efficient method used for the disposal of hospital-generated waste.

- A. Incinerator
- B. Furnace
- C. Open dumps
- D. Sanitary landfills

**Q20 General Abilities**

The effect of particulate matter which is a common air pollutant is maximally seen on the _____.

- A. liver
- B. intestines
- C. kidneys
- D. lungs



Q21 General Abilities

Which of the following metals is placed between aluminium and zinc in the reactivity series?

- A. Copper
- B. Carbon
- C. Iron
- D. Magnesium ✓

Q22 General Abilities

The method of storage of nuclear wastes is to be done in _____.

- A. bottles
- B. dustbins
- C. open containers
- D. shielded containers ✓

Q23 General Abilities

Who among the following is NOT appointed by the President of India?

- A. Comptroller and Auditor General
- B. Governors of States
- C. Vice President ✓
- D. Chief Election Commissioner

Q24 General Abilities

Which of the following is an effective way to prevent rancidity in packaged food?

- A. Keeping it in direct sunlight
- B. Storing in a warm place
- C. Increasing moisture content
- D. Adding antioxidants ✓

Q25 General Abilities

What happens when you use the 'Sort A to Z' option on a column containing text?

- A. The text remains unchanged.
- B. The text is sorted from Z to A.
- C. The text is converted into numbers.
- D. The text is sorted alphabetically from A to Z. ✓

Q26 General Abilities

Which of the following is NOT a file management task?

- A. Browsing the internet ✓
- B. Deleting files
- C. Renaming files
- D. Creating files

Q27 General Abilities

Which property of solids allows them to be compressed the least compared to liquids and gases?

- A. High kinetic energy of particles
- B. High intermolecular spaces
- C. Strong intermolecular forces and close packing of particles ✓
- D. The ability to diffuse into other solids

Q28 General Abilities

Which of the following best describes a heterogeneous mixture?

- A. It contains only one phase.
- B. It has a uniform composition.
- C. The composition varies throughout the mixture. ✓
- D. The components cannot be separated.

Q29 General Abilities

The Montreal Protocol came into force in the year _____.

- A. 1992
- B. 1989 ✓
- C. 1986
- D. 1990

Q30 General Abilities

The Punjab Plain is formed by which river system?

- A. Indus and its tributaries ✓
- B. Narmada and its tributaries
- C. Brahmaputra and its tributaries
- D. Ganga and its tributaries



Q31 General Abilities

Which dynasty was overthrown by Chandragupta Maurya to establish the Mauryan Empire?

- A. Gupta Dynasty
- B. Nanda Dynasty ✓
- C. Shunga Dynasty
- D. Kushan Dynasty

Q32 General Abilities

In an experiment, 25 g of reactant A reacts with 35 g of reactant B to form 50 g of product C and some amount of product D. What is the mass of product D?

- A. 35 g
- B. 60 g
- C. 10 g ✓
- D. 25 g

Q33 General Abilities

What are the sand dunes commonly found in the Indian Desert called?

- A. Moraines
- B. Loess
- C. Barchans ✓
- D. Cirques

Q34 General Abilities

As per Article 78, it is the duty of the Prime Minister to communicate all decisions of the Council of Ministers to whom?

- A. Chief Justice of India
- B. Vice President
- C. President ✓
- D. Speaker of Lok Sabha

Q35 General Abilities

A student calculates the formula unit mass of calcium fluoride (CaF_2). If the atomic masses of Ca and F are 40 u and 19 u, respectively, what is the correct formula unit mass?

- A. 97 u
- B. 100 u
- C. 59 u
- D. 78 u ✓

Q36 General Abilities

Which of the following is an example of a WAN?

- A. A Bluetooth connection between a phone and a laptop
- B. The internet ✓
- C. A university campus network
- D. A home Wi-Fi network

Q37 General Abilities

Which statement correctly explains why liquids can flow?

- A. Liquids have no intermolecular forces.
- B. Liquids do not have kinetic energy.
- C. Liquids have loosely packed molecules that slide past each other. ✓
- D. Liquid molecules move randomly without any restriction.

Q38 General Abilities

In December 2024, Jasprit Bumrah became the fastest Indian bowler to reach 200 Test wickets during which of the following series/tournament?

- A. India vs England Test Series
- B. Asia Cup
- C. India vs New Zealand Test Series
- D. Border-Gavaskar Trophy ✓

Q39 General Abilities

Who among the following won the gold medal in the women's high jump event at the National Games in February 2025?

- A. Swapna Barman
- B. Abhinaya Shetty
- C. Pooja Singh ✓
- D. Vithya Ramraj

Q40 General Abilities

The speed of a wave is given by which of the following formulas?

- A. Speed = Time × Frequency
- B. Speed = Amplitude × Wavelength
- C. Speed = Frequency × Wavelength ✓
- D. Speed = Frequency × Amplitude



Q41 General Abilities

Under the Delhi Sultanate what was the name of the state laws that grew under the monarchy, even if they violated the Shari'at?

- A. Farman
- B. Iqta
- C. Fatwas
- D. Zawabit

**Q42 General Abilities**

If the area of contact increases while keeping the thrust constant, the pressure will _____.

- A. first increase, then decrease
- B. increase
- C. decrease
- D. remain the same

**Q43 General Abilities**

If the mass of an object is 74.5 kg, what is its approximate weight on Earth? (Take $g = 9.8 \text{ m/s}^2$)

- A. 7.6 N
- B. 730 N
- C. 74.5 N
- D. 447 N

**Q44 General Abilities**

Where is the magnetic field strength maximum around a magnet?

- A. At infinity
- B. At the centre of the magnet
- C. At the poles of the magnet
- D. Equidistant from the poles

**Q45 General Abilities**

According to the Tendulkar methodology, what was the estimated national poverty line for rural areas in 2011-12?

- A. ₹816 per month
- B. ₹1,200 per month
- C. ₹512 per month
- D. ₹1,000 per month

**Q46 General Abilities**

If three resistors of 15Ω , 35Ω and 50Ω are connected in series to a 25-V battery, what is the current flowing in the circuit?

- A. 0.25 A
- B. 1.5 A
- C. 4 A
- D. 2.88 A

**Q47 General Abilities**

What is the purpose of the 'BCC' field in an email?

- A. It allows recipients to see each others' addresses.
- B. It deletes an email after it is read.
- C. It hides recipients from each other.
- D. It marks an email as urgent.

**Q48 General Abilities**

Which of the following is NOT an example of system software?

- A. macOS
- B. Windows 10
- C. Microsoft Word
- D. Linux

**Q49 General Abilities**

In September 2024, which of the following Indian institutions was designated as the Thematic Hub for Quantum Computing under the National Quantum Mission?

- A. Indian Institute of Science Bengaluru
- B. Indian Institute of Technology Gandhinagar
- C. Indian Institute of Technology Kanpur
- D. Indian Institute of Technology Madras

**Q50 General Abilities**

When were the 38th National Games held in Uttarakhand?

- A. January 15 - 30, 2025
- B. February 1 - 20, 2025
- C. January 28 - February 14, 2025
- D. February 10 - 25, 2025



Q51 Technical Abilities

Which of the following is generally used for melting metal in the metallic gun type of metal spraying process?

- A. Compressed air
- B. Electric arc
- C. Plasma torch
- D. Oxy acetylene flame ✓

Q52 Technical Abilities

A symmetrical channel section has width of its top and bottom flanges as 100 mm and thickness 10 mm. The web is 80 mm high between flanges and 10 mm thick. Its moment of inertia about a centroidal axis in its plane parallel to the flanges is $449.3 \times 10^4 \text{ mm}^4$. Calculate its moment of inertia about a parallel axis at the top face of the upper flange.

- A. 1415×10^3
- B. 20.3×10^4
- C. 43,000
- D. 1149.3×10^4 ✓

Q53 Technical Abilities

What is the purpose of introducing two equal and opposite forces at a different point on a rigid body?

- A. To transfer the original force to a new location ✓
- B. To increase the force acting on the body
- C. To change the direction of the applied force
- D. To balance the rotational motion of the body

Q54 Technical Abilities

The disadvantage of the early shadow projector was that the:

- A. magnification was insufficient ✓
- B. image was distorted
- C. screen was too far from the operator
- D. image was too small

Q55 Technical Abilities

Which of the following statements best describes a special-purpose lathe used for heavy-duty applications?

- A. A missile lathe is designed for lightweight parts with small diameters.
- B. A gap bed lathe is mainly used for cutting small, high-precision components.
- C. A wheel lathe is designed for machining railway wheels, including journals and treads. ✓
- D. A T-lathe is used for machining flat plates and sheet metal components.

Q56 Technical Abilities

The manometric efficiency in a pump is the ratio of:

- A. the fluid density to the pump speed
- B. the temperature difference between inlet and outlet
- C. the actual pressure head produced to the theoretical pressure head ✓
- D. the theoretical head to the actual head

Q57 Technical Abilities

The _____ concept is derived from the Pareto's 80/20 rule curve.

- A. ABC ✓
- B. FSN
- C. VED
- D. XYZ

Q58 Technical Abilities

What is the accuracy of the universal bevel protractor?

- A. 5-minute (5') ✓
- B. 8-minute (8')
- C. 15-minute (15')
- D. 12-minute (12')

Q59 Technical Abilities

Which of the following is NOT a feature of pneumatic comparators?

- A. No wearing of parts
- B. Non-contact inspection of work parts
- C. High range of amplification
- D. Presence of hysteresis ✓



Q60 Technical Abilities

Identify the gas used in Tungsten Inert Gas Welding (TIG).

- A. Oxygen-hydrogen mixtures
- B. Hydrogen-nitrogen mixtures
- C. Argon-helium mixtures ✓
- D. Oxygen-nitrogen mixtures

Q61 Technical Abilities

Blowholes are welding defects caused by _____.

- A. too great a heat concentration
- B. poor edge preparation
- C. unsuitable parent metals used in the weld
- D. gas being trapped and due to moisture ✓

Q62 Technical Abilities

Which test is commonly used to measure the malleability of a material?

- A. Compression test ✓
- B. Torsion test
- C. Impact test
- D. Hardness test

Q63 Technical Abilities

Which of the following pigments provide anti-corrosion characteristics in the organic coating?

- A. Barium metaborate
- B. Limestone
- C. Zinc phosphate ✓
- D. Lithopone

Q64 Technical Abilities

The modulus of resilience is characterised by the area located under the stress-strain curve up to the:

- A. fracture point
- B. point where strain hardening starts
- C. proportional limit ✓
- D. ultimate point

Q65 Technical Abilities

Forced convection is primarily characterised by:

- A. heat transfer occurring solely through radiation
- B. the natural buoyancy-driven flow of the fluid
- C. the use of external devices such as fans or pumps to move the fluid ✓
- D. the absence of any temperature gradients in the fluid

Q66 Technical Abilities

Which factor does NOT directly affect the power required to drive a centrifugal pump?

- A. Fluid density
- B. Fluid viscosity
- C. Flow rate
- D. Atmospheric pressure ✓

Q67 Technical Abilities

The reversed Carnot cycle is used as a basis for which of the following?

- A. Steam turbines
- B. Internal combustion engines
- C. Refrigerators and heat pumps ✓
- D. Heat engines

Q68 Technical Abilities

What type of abrasive is suitable for grinding glass and ceramic materials?

- A. Diamond
- B. Copper boron nitride
- C. Magnesium oxide
- D. Silicon carbide ✓

Q69 Technical Abilities

The flange of an I-section is 100 mm wide and 10 mm thick, and has moment of inertia I_f about its own centroidal axis parallel to flange length, in the plane of the flange. Its centroidal axis is 50 mm from the centroidal axis X-X of the I-section normal to the web in the plane of the I-section. Area moment of inertia of the flange about axis X-X is:

- A. $I_f - 25 \times 10^5 \text{ mm}^4$
- B. 8333 mm^4
- C. $I_f + 25 \times 10^5 \text{ mm}^4$ ✓
- D. $I_f + 50,000 \text{ mm}^4$



Q70 Technical Abilities

When using a Venturi meter, a decrease in the cross-sectional area causes:

- A. no change in velocity
- B. an increase in static pressure
- C. an increase in fluid density
- D. a decrease in static pressure ✓

Q71 Technical Abilities

In a four-stroke diesel engine, the exhaust valve opens before the piston reaches the Bottom Dead Center to:

- A. improve fuel atomisation ✓
- B. enhance air-fuel mixing
- C. reduce pumping losses
- D. increase the compression ratio

Q72 Technical Abilities

How does indicated power differ from brake power in an internal combustion engine?

- A. Indicated power is derived from combustion chamber pressures, whereas brake power is the net output at the crankshaft after mechanical losses. ✓
- B. Indicated power accounts for frictional losses, whereas brake power does not.
- C. Indicated power is measured at the engine's output shaft, while brake power is measured in the cylinders.
- D. Both indicated and brake power represent the same value under ideal conditions.

Q73 Technical Abilities

What does mean effective pressure (MEP) indicate in engine performance analysis?

- A. The average pressure acting on the piston during the complete engine cycle that would produce the measured work output ✓
- B. The pressure of the fuel injected into the cylinder
- C. The maximum pressure reached in the combustion chamber
- D. The difference between intake and exhaust pressures

Q74 Technical Abilities

What is the effect of compression ratio (CR) on the air standard efficiency of otto and diesel cycles?

- A. CR has no effect on efficiency.
- B. Higher CR always leads to higher efficiency. ✓
- C. Lower CR always leads to higher efficiency.
- D. Efficiency increases with CR in SI engines and decreases in CI engines.

Q75 Technical Abilities

In production engineering, gear hobbing is a ____.

- A. primary shaping process
- B. surface finishing process
- C. machining process ✓
- D. joining process

Q76 Technical Abilities

EOQ stands for:

- A. Ensemble Ordering Quantity
- B. Economic Ordering Quantity ✓
- C. Electronic Ordering Quantity
- D. Electrical Ordering Quantity

Q77 Technical Abilities

The thermal efficiency of the Otto cycle is a function of:

- A. compression ratio and the ratio of specific heats ✓
- B. engine size and speed
- C. heat supplied and pressure ratio
- D. temperature and mass flow rate

Q78 Technical Abilities

IC engines are classified into carburetor engine and air injection engine based on the:

- A. speed of the engine
- B. number of cylinders
- C. cooling system used
- D. method of fuel injection ✓



Q79 Technical Abilities

If any part is immersed in a heated 'magnesium dihydrogen phosphate' solution, then what could be the coating process?

- A. Anodising
- B. Calorising
- C. Cladding
- D. Parkerizing

**Q80 Technical Abilities**

In the ____ method, a large amount of solder is melted in a tank that is closed.

- A. soldering iron
- B. infrared soldering
- C. dip soldering
- D. flame soldering

**Q81 Technical Abilities**

Which of the following CANNOT be generally utilised as an abrasive material in the grinding process?

- A. Super alloy
- B. Diamond
- C. Aluminium oxide
- D. Silicon carbide

**Q82 Technical Abilities**

According to Herzberg's Two-Factor Theory, the 'hygiene factor' that leads to job dissatisfaction is:

- A. achievement
- B. salary
- C. recognition
- D. responsibility

**Q83 Technical Abilities**

The function of the supporting column in a Tool Maker's Microscope is to ____.

- A. magnify the image
- B. illuminate the workpiece
- C. hold the specimen in place
- D. provide vertical working distance

**Q84 Technical Abilities**

Which of the following can be used for angular measurements?

- A. Micrometer
- B. Autocollimator
- C. Depth Gauge
- D. Slip Gauge

**Q85 Technical Abilities**

Gauge pressure is measured as:

- A. the pressure relative to a perfect vacuum
- B. the pressure due solely to the fluid's density
- C. the difference between absolute pressure and atmospheric pressure
- D. the pressure including atmospheric pressure

**Q86 Technical Abilities**

Which of the following interactions is expected to produce chip during a grinding process?

- A. Grit-workpiece
- B. Bond-workpiece
- C. Chip-bond
- D. Chip-workpiece

**Q87 Technical Abilities**

_____ is used in Submerged Arc Welding process.

- A. Graphite electrode
- B. Consumable bare electrode
- C. Tungsten electrode
- D. Carbon electrode

**Q88 Technical Abilities**

The area between the 'Total revenue' line and the 'Total costs' line to the right of the break-even point represents:

- A. variable costs
- B. loss zone
- C. fixed costs
- D. profit zone



Q89 Technical Abilities

In the resolution of a force, along which of the following directions is a force generally resolved?

- A. Any three random directions
- B. Two parallel directions
- C. A single fixed direction
- D. Two mutually perpendicular directions ✓

Q90 Technical Abilities

In the up-milling process, the metal is removed in the form of small chips by a cutter rotating ____.

- A. in the same direction of the feed of the workpiece
- B. perpendicular to the direction of the travel of the workpiece
- C. Metal will not be removed in the milling process.
- D. against the direction of the travel of the workpiece ✓

Q91 Technical Abilities

Which of the following factors primarily influences the toughness of a material?

- A. Elastic modulus
- B. Surface finish
- C. Yield strength
- D. Grain size ✓

Q92 Technical Abilities

For a closed system undergoing a process (not a cycle), the first law is expressed as:

- A. $\Delta U = Q - W$ ✓
- B. $\Delta S \geq 0$
- C. $Q = W$
- D. $PV = nRT$

Q93 Technical Abilities

In Arc Welding process, welding cables are used for _____.

- A. connecting to the hand held electrode directly and conducting current to it
- B. frequently igniting the welding torch
- C. conduction of current from the welding machine to the electrode holder ✓
- D. cleaning the surface to be welded

Q94 Technical Abilities

Which of the following best describes the primary function of a simple carburetor in a petrol engine?

- A. To electronically control the fuel injection timing
- B. To compress the air-fuel mixture before combustion
- C. To atomise and mix fuel with air in the proper ratio ✓
- D. To regulate exhaust emissions via catalytic conversion

Q95 Technical Abilities

What is a coplanar force system?

- A. A system where forces act only in one direction
- B. A system where forces do not intersect at a point
- C. A system where all forces lie in the same plane ✓
- D. A system where all forces lie in different planes

Q96 Technical Abilities

Which of the following is true about the weldability of mild steel and alloy steel?

- A. Both mild and alloy steel have the same weldability.
- B. Weldability depends only on the thickness of the steel.
- C. Mild steel is easier to weld than alloy steel. ✓
- D. Alloy steel is easier to weld than mild steel.

Q97 Technical Abilities

If the degree of the shear force diagram is x, then the:

- A. degree of the bending moment diagram is $x + 1$ ✓
- B. degree of the loading curve is $x + 1$
- C. degree of the bending moment diagram is $x - 1$
- D. degree of the loading curve is x

Q98 Technical Abilities

In a parting-off operation, how is the cutting tool fed into the workpiece?

- A. By adjusting the tailstock manually
- B. By rotating the headstock spindle directly
- C. By rotating the cross-slide screw by hand ✓
- D. By moving the carriage along the lathe bed



Q99 Technical Abilities

Which of the following is NOT a type of nitriding process?

- A. Liquid nitriding
- B. Gas nitriding
- C. Plasma nitriding
- D. Vacuum nitriding ✓

Q100 Technical Abilities

The reason for a company to strongly favour buying a component even if they could make it themselves is that the:

- A. company wants to maintain design secrecy
- B. vendor offers a lower cost and higher quality ✓
- C. company has excess manufacturing capacity
- D. company wants to improve its quality control

Q101 Technical Abilities

Three collinear horizontal forces of magnitudes 250 N, 150 N and 350 N are acting on a rigid body. If the 150 N force acts in the opposite direction, determine the resultant force.

- A. 450 N ✓
- B. 350 N
- C. 250 N
- D. 550 N

Q102 Technical Abilities

A cantilever beam with a span length of L m carries a uniform moment of intensity 'M' N-m/m. Which of the following statements is correct?

- A. Shear force throughout the length will be ML.
- B. Shear force throughout the length will be M/L.
- C. Shear force throughout the length will be ML/2.
- D. Shear force throughout the length will be zero. ✓

Q103 Technical Abilities

What is lack of penetration in welding defects?

- A. Failure of the filler metal to fuse with the parent metal
- B. Small holes throughout the weld metal
- C. Failure of the filler metal to penetrate into the root of the joint ✓
- D. Cracks either in the weld metal or in the parent metal

Q104 Technical Abilities

The value of density of water at room temperature is ____.

- A. 10 gm/cm³ or 10000 kg/m³
- B. 1 gm/cm³ or 1000 kg/m³ ✓
- C. 2 gm/cm³ or 2000 kg/m³
- D. 3 gm/cm³ or 3000 kg/m³

Q105 Technical Abilities

In a two-stroke petrol engine, the inlet port is opened by the piston:

- A. 30° to 40° before BDC ✓
- B. 30° to 40° after BDC
- C. 40° to 55° before BDC
- D. 45° to 55° before TDC

Q106 Technical Abilities

What is the basic function of a single volute casing in a centrifugal pump?

- A. To direct the fluid flow and convert kinetic energy into pressure ✓
- B. To divide the fluid into multiple streams
- C. To reduce the temperature of the fluid
- D. To increase the speed of the fluid

Q107 Technical Abilities

The function of fluxes in soldering is ____.

- A. to remove oxides and other surface compounds from the surfaces to be soldered ✓
- B. to heat metal over a range of temperature up to fusion and then allow to cool
- C. to remove dirt particles and other surface compounds from the surfaces to be soldered
- D. to use consumable bare electrode in combination with a flux feeder tube

Q108 Technical Abilities

Which of the following elements is NOT a primary alloying element in stainless steel?

- A. Nickel
- B. Chromium
- C. Carbon
- D. Lead ✓



Q109 Technical Abilities

The Stefan-Boltzmann law is derived from:

- A. Wien's Displacement Law
- B. Fourier's Law
- C. Kirchhoff's Law
- D. Planck's Law ✓

Q110 Technical Abilities

In graphical representation of the cost-volume relationship, the point where the 'Total revenue' line intersects the 'Total costs' line represents the:

- A. variable costs
- B. margin of safety
- C. break-even point ✓
- D. maximum profit

Q111 Technical Abilities

What is the primary mechanism by which thermal radiation transfers energy?

- A. Convection due to fluid motion
- B. Conduction through molecular collisions
- C. Direct transfer via physical contact
- D. Electromagnetic waves ✓

Q112 Technical Abilities

What happens to the mechanical properties of mild steel when carbon content increases?

- A. Strength decreases and ductility increases
- B. Strength increases and ductility decreases ✓
- C. Both strength and hardness decrease
- D. Both strength and ductility increase

Q113 Technical Abilities

The design of a semi-open impeller makes it suitable for:

- A. fluids with moderate amounts of suspended solids while providing better efficiency than open impellers ✓
- B. only low flow rate applications
- C. applications requiring the highest efficiency regardless of clogging
- D. liquids with very high solid content

Q114 Technical Abilities

The ____ in a broaching tooth is provided to prevent rubbing of the tool with the workpiece.

- A. face angle
- B. back-off angle ✓
- C. hook angle
- D. front rake angle

Q115 Technical Abilities

Which of the following statements is correct regarding electroplating?

- A. The rate of anodic dissolution is found equal to the rate of deposition of metal onto the substrate. ✓
- B. The dissolution of metal starts at the cathode.
- C. The metal is deposited on the anode.
- D. The rate of anodic dissolution is found greater to the rate of deposition of metal onto the substrate.

Q116 Technical Abilities

Broaching is a ____ that uses a toothed tool to remove the material from the workpiece.

- A. grinding process
- B. boring process
- C. casting process
- D. machining process ✓

Q117 Technical Abilities

The influence of forecasting in volume decision-making with regards to production is that it:

- A. reduces manufacturing costs
- B. ensures that all products meet international standards
- C. determines the specific design of the product
- D. determines whether production is for stock or for immediate orders ✓

Q118 Technical Abilities

Parallel shank type and morse taper shank type drills belong to ____ type of drills.

- A. straight-fluted
- B. twist ✓
- C. flat
- D. hexagonal



Q119 Technical Abilities

Which of the following end conditions could characterise a cantilever beam?

- A. A fixed support at one end and pin support at the other
- B. A hinged support at one end and free at the other
- C. A roller support at one end and hinged at the other
- D. A fixed support at one end and free at the other ✓

Q120 Technical Abilities

What is Lack of Fusion in welding defects?

- A. It is a group of small holes throughout the weld metal.
- B. It is the failure of the filler metal to penetrate into the welding joint.
- C. It is the failure of the filler metal to fuse with the parent metal. ✓
- D. It is the entrapment of slag or other impurities in the weld.

Q121 Technical Abilities

Which of the following statements accurately describes vacuum pressure?

- A. It is the absolute pressure at any point in a fluid.
- B. It is the pressure below atmospheric pressure in a system. ✓
- C. It is the pressure due to the weight of a fluid column.
- D. It is the pressure exerted by the atmospheric air.

Q122 Technical Abilities

A centrifugal pump has a hydraulic power output of 10 kW and consumes 15 kW of mechanical power. Calculate its overall efficiency.

- A. 75%
- B. 50%
- C. 66.7% ✓
- D. 80%

Q123 Technical Abilities

The purpose of scheduling in Production Planning and Control is to:

- A. determine the cost of materials
- B. hire new personnel
- C. design new product layouts
- D. ensure products are completed on time ✓

Q124 Technical Abilities

At which location on a beam section will the maximum bending moment occur, concerning the shear force?

- A. Where shear force will change its sign ✓
- B. Where shear force will be minimum
- C. Bending moment does not depend upon shear force.
- D. Where shear force will be maximum

Q125 Technical Abilities

To measure surface finish, the two types of stylus instruments used are:

- A. Contact and Non-contact ✓
- B. Digital and Analog
- C. Manual and Automated
- D. True Datum and Surface Datum

Q126 Technical Abilities

A material exhibits a large amount of plastic deformation before fracture and can absorb significant energy. This material is said to have:

- A. high hardness
- B. high modulus of elasticity
- C. high strength
- D. high toughness ✓

Q127 Technical Abilities

Thermal stress in a composite bar DOES NOT depend on which of the following factors?

- A. Area of cross-section ✓
- B. Modulus of elasticity
- C. Temperature change
- D. Coefficient of thermal expansion

Q128 Technical Abilities

In the analytical method, how is the resultant force determined when all forces act in the same direction?

- A. By multiplying all the forces together
- B. By dividing the total force by the number of forces
- C. By adding all the forces together ✓
- D. By subtracting the smallest force from the largest



Q129 Technical Abilities

Which of the following components generally evaporate in the organic coating?

- A. Additives
- B. Binder
- C. Solvents
- D. Pigments

**Q130 Technical Abilities**

The type of surfaces best suited for measuring surface roughness using a Light Interference Microscope are ____.

- A. soft or thin surfaces
- B. surfaces requiring high-precision 3D mapping
- C. liquid surfaces
- D. very large surface areas

**Q131 Technical Abilities**

_____ is used for mixing oxygen and acetylene in gas welding processes.

- A. Spark-lighter
- B. Welding torch
- C. Earth clamp
- D. Goggles

**Q132 Technical Abilities**

Fatigue failure in materials occurs due to:

- A. cyclic loading
- B. low temperature
- C. high temperature
- D. constant stress

**Q133 Technical Abilities**

What bond is commonly employed in super abrasive grinding wheels?

- A. Brazed bond
- B. Oxychloride bond
- C. Shellac bond
- D. Metal bond

**Q134 Technical Abilities**

Given an annual usage value of 400 units, the procurement cost is ₹20 per order, cost per piece is ₹100 and cost of carrying inventory is 10%. Calculate the economic order quantity.

- A. 50
- B. 60
- C. 30
- D. 40

**Q135 Technical Abilities**

In the Carbon Arc Welding (CAW) process, _____ is used to create an electric arc.

- A. stainless steel electrode
- B. pure graphite electrode
- C. cellulosic electrode
- D. rutile electrode

**Q136 Technical Abilities**

In a radial flow pump, the fluid primarily flows:

- A. outward radially from the impeller centre
- B. inward radially toward the impeller centre
- C. parallel to the pump shaft
- D. in a circular path around the pump shaft

**Q137 Technical Abilities**

Which of the following back pressure gauges is NOT used in Pneumatic Comparators?

- A. Absolute back pressure gauge
- B. Differential back pressure gauge
- C. Water column back pressure gauge
- D. Venturi back pressure gauge

**Q138 Technical Abilities**

Compared to a single volute casing, a double volute casing with a vaned diffuser generally provides:

- A. lower efficiency due to complex flow paths
- B. lower pressure generation capability
- C. better hydraulic performance and efficiency
- D. increased wear on pump components



Q139 Technical Abilities

What is the maximum angle that can be generally set using a sine bar?

A. 45°



B. 75°

C. 60°

D. 90°

Q140 Technical Abilities

Name the part of a milling machine on which milling cutters are securely mounted and rotated.

A. Saddle

B. Front brace

C. Arbor



D. Overhanging arm

Q141 Technical Abilities

Which of the following is NOT a requirement of an ignition system in a spark-ignition engine?

A. Generating sufficient voltage to jump the spark plug gap

B. Timing the spark to coincide with the compression stroke

C. Mixing air and fuel in the intake manifold



D. Maintaining consistent spark duration across all RPMs

Q142 Technical Abilities

When is the lead screw engaged in a lathe?

A. Only during thread-cutting operations



B. Continuously for all machining processes

C. During both knurling and continuous feed motion

D. Only for turning and facing operations

Q143 Technical Abilities

If 30 m is the height difference between the two rollers and 60 m is the distance between the centres of the rollers, what is the angle formed between the upper surface of a sine bar and the surface plate (datum)?

A. 30°



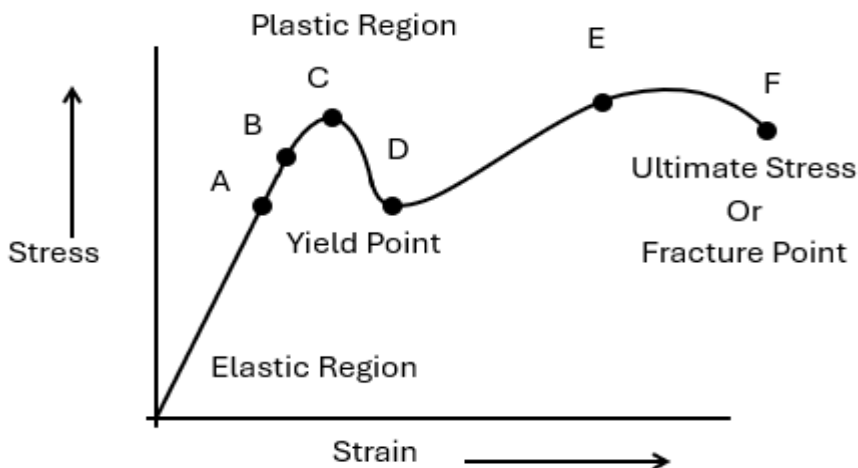
B. 60°

C. 45°

D. 90°

Q144 Technical Abilities

Which region of the stress-strain curve as shown below represents work hardening in ductile materials?



A. D-E

B. C-D



C. A-C

D. E-F



Blackbook Vocabulary — Now in the App!

Download Now on Google Play

Q145 Technical Abilities

If the area under the shear force diagram between two specified points is equal to P , then the difference in the bending moments at those points will be:

A. Zero

B. $2P$ C. $\frac{P}{2}$ D. P **Q146** Technical Abilities

A cantilever beam with span length L m carries a point load ' w ' N at the free end. What will be the value of the resisting bending moment at the fixed end?

A. Zero

B. wL C. $\frac{wL}{2}$ D. $2wL$ **Q147** Technical Abilities

The efficiency of the Carnot cycle is defined as:

A. $\frac{\text{Work done}}{\text{Heat rejected}}$ B. $\frac{\text{Heat rejected}}{\text{Heat supplied}}$ C. $\frac{\text{Heat supplied}}{\text{Work done}}$ D. $\frac{\text{Work done}}{\text{Heat supplied}}$ 

Q148 Technical Abilities

A thin cylindrical pressure vessel with inside radius 'R' and metal thickness 't' is subject to an internal fluid pressure 'P.' What is the value of longitudinal stress?

A. $\frac{PR}{2t}$



B. $\frac{PR}{t}$

C. $\frac{2PR}{t}$

D. $\frac{3PR}{2t}$

Q149 Technical Abilities

The moment of inertia of a circular area about a tangent to the circle is calculated as the moment of inertia of the circular area about its centroidal axis in the plane of the lamina _____ (where r is the circle radius).

A. $+\pi r^4$



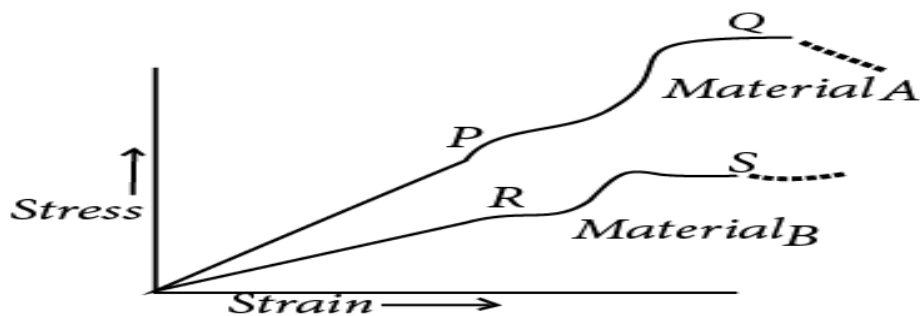
B. $\times 1.5$

C. $\times \pi r^2/2$

D. $-\pi r^4$

Q150 Technical Abilities

The diagram below shows the stress-strain curves of two materials, Material A and Material B. Material A has a finer grain structure, while Material B has a coarser grain structure. Based on the diagram, which of the following statements is correct regarding their toughness?



A. Both materials have the same toughness, as indicated by their identical total strain values.

B. Toughness can be determined directly by comparing the slopes of the stress-strain curves.

C. Material A (finer grain size) has lower toughness than Material B (coarser grain size).

D. Material A (finer grain size) has higher toughness than Material B (coarser grain size).

