

L - 2
JT (Design)

Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram

Exam (Level 2): Junior Technician- Design

Instructions

1. The question paper consists of **100 Multiple Choice Questions (MCQs)**.
2. Each question carries **1 mark**.
3. **Negative marking:** For every wrong answer, **0.25 marks** will be deducted.
4. **Duration of the examination:** ~~2~~ hour 30 minutes. [150 MINS]
5. Attempt all questions carefully.

1. What does STL stand for in 3D printing?

- A. Standard Tiling Language
- B. Standard Triangle Language
- C. Stereolithography
- D. Surface Tessellation Layer

2. Increasing the number of triangles in an STL file generally:

- A. Reduces file size
- B. Makes the model smoother
- C. Causes colour loss
- D. Prevents slicing

3. ISO 14000 standards are mainly related to:

- A. Product quality inspection
- B. Occupational health and safety
- C. Information security
- D. Environmental management systems

4. Identifying the right use of materials is part of:

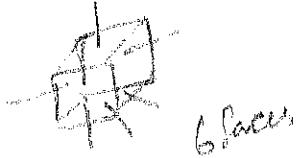
- A. Safety training
- B. Problem identification
- C. Creativity
- D. Drawing practice

tion skills help a technician to:

- A. Detect hidden problems
- B. Ignore small defects
- C. Work without checking
- D. Delay maintenance

6. A cube has all faces red. If the cube is cut into 8 equal smaller cubes, how many smaller cubes will have 3 red faces?

- A. 2
- B. 3
- C. 6
- D. None of the Above



7. Which shape cannot be the top view of a cylinder?

- A. Circle
- B. Ellipse
- C. Rectangle
- D. None of the above

8. When a figure is enlarged or reduced proportionally, this process is called:

- A. Reflection
- B. Rotation
- C. Translation
- D. Scaling

9. The symbol for surface profile is:

- A. ||
- B. +
- C. ~
- D. Φ

10. When a 3D object is unfolded into a flat 2D pattern, it is called:

- A. Projection
- B. Section
- C. Net
- D. Rendering

11. The symbol for first angle and third angle projection is based on:

- A. A cone
- B. A truncated cone
- C. A cylinder
- D. A sphere

12. In first angle projection, the right-side view appears:

- A. At right side of front view
- B. At left side of front view
- C. Below front view
- D. Above front view

13. Which angle of projection is widely used in India?

- A. First and Second angle
- B. First and Third angle
- C. Second angle
- D. First angle

14. Isometric drawing uses angles of:

- A. 90°
- B. 60°
- C. 45°
- D. 120°

15. The symbol used for surface roughness is:

- A. Triangle
- B. Zigzag
- C. Check mark
- D. Slant V-shaped mark

16. Center lines consist of:

- A. Long-short-long
- B. Short-short-short
- C. Thick dotted
- D. Continuous curved

17. A zigzag line on a drawing indicates:

- A. Center location
- B. Cutting plane

- C. Long break
- D. Hidden detail

18. The mechanical properties of good product material are

- A. Strength, Toughness and Ductility
- B. Strength and Toughness
- C. Ductility
- D. None of the above

19. Product development begins with:

- A. Market need identification
- B. Material selection
- C. Production planning
- D. Packaging

20. The following is the preliminary stage of Production planning

- A. Capacity planning
- B. Material requirements planning
- C. Scheduling
- D. Product development and design

21. CAD software helps mainly in:

- A. Manual drafting
- B. Sales analysis
- C. Packaging
- D. None of the Above

22. Value engineering aims to:

- A. Increase cost
- B. Increase product performance
- C. Improve value by optimizing cost and function
- D. Reduce quality

23. A number that represents a combination of a camera's shutter speed, aperture, and ISO

- A. Aperture
- B. Rule of thirds
- C. white balance
- D. Exposure Value (EV)

24. Which of these is not a type of Camera Lens?

- A. Telephoto

- B. Prime
- C. Immersion
- D. Fish Eye

25. Resolution indicates the amount of detail in a digital photo. It indicated in PPI, which stands for?

- A. Pixels per inch
- B. Pixels per indicator
- C. Pins per inch
- D. Print per inch

26. The modifier "MMC" stands for in GD&T:

- A. Maximum Material Condition
- B. Minimum Machining Capacity
- C. Mechanical Material Control
- D. Main Manufacturing Condition

27. Which one is NOT a type of geometric characteristic?

- A. Form
- B. Orientation
- C. Material hardness
- D. Location

28. The material used in vacuum forming is usually:

- A. Thermoset plastics
- B. Thermoplastic sheets
- C. Metal sheets
- D. Rubber

29. Using tungsten film in daylight causes option

- A. Red cast
- B. Blue cast
- C. green cast
- D. Orange cast

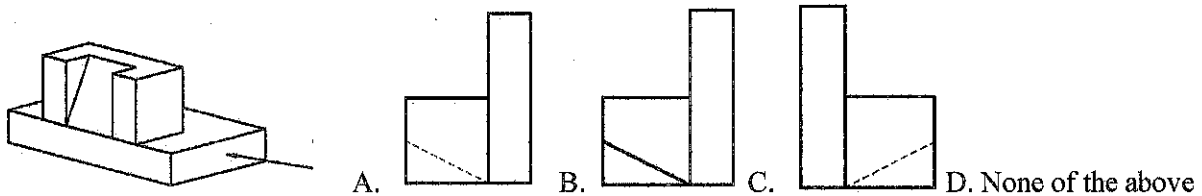
30. If you have a camera with 1.5 crop factor and use a 200mm f/2.8 lens what would be the equivalent focal length?

- A. 150mm
- B. 200mm
- C. 250mm
- D. 300mm

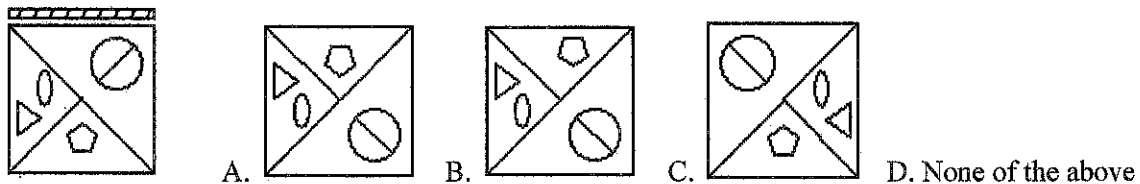
31. In the 3rd quadrant, the object is placed: (HP-Vertical Plane, VP- Horizontal Plane)

- A. Below HP, in front of VP
- B. Above HP, behind VP
- C. Above HP, in front of VP
- D. None of the Above

32. Find out the right-side view from given isometric view



33. If the mirror image is place on the hatch section, then which of the answer will be right image in the given figure?



34. Who Made the First advances in colour Photography?

- A. Herman Vogel
- B. James Clerk Maxwell
- C. Auguste and Louis Lumiere
- D. Ducas du Hauron

35. The unit of frame rate used in computer monitors is:

- A. Pixels per inch (PPI)
- B. Bits per second (bps)
- C. Candela per square meter (cd/m^2)
- D. Hertz (Hz)

36. What is this shape called?



- A. Helical.
- B. Drum
- C. Mobius Strip
- D. Klien Strip

37. Creating everyday sounds in movie post production is called?

- A. Dubbing
- B. Foley
- C. Lay back
- D. ADR

38. Gestalt Laws are related to

- A. Visualization
- B. Recreation
- C. Perception
- D. Imagination

39. Who is the author of the book "The Design of Everyday Things"?

- A. Klaus Krippendorff
- B. Karl T. Ulrich
- C. Edward De Bono
- D. Donald Norman

40. Which of the following is a key design consideration in Additive Manufacturing?

- A. Reducing part complexity
- B. Avoiding undercuts
- C. Optimizing part orientation
- D. Minimizing digital file size

41. Which design feature should be minimized for better print success?

- A. Sharp corners
- B. Fillets
- C. Draft angles
- D. Chamfers

42. For FDM printing, the best way to avoid warping is:

- A. Increase cooling fan speed
- B. Use a heated bed
- C. Reduce extrusion temperature
- D. Print at high speed

43. How does a thermos flask keep liquid hot or cold?

- A. By storing heat
- B. By using cold air
- C. By preventing heat transfer
- D. By trapping gases

44. Why is the inside of a refrigerator cold?

- A. Cold air enters from outside
- B. Compressor removes heat from inside
- C. Water is sprayed inside
- D. Food absorbs the heat

45. Why does a metal spoon feel colder than a wooden spoon at room temperature?

- A. Metal is heavier
- B. Wood contains moisture
- C. Wood is rough
- D. Metal is a good conductor of heat

46. A designer wants faster assembly in mass production. Best approach:

- A. Add more screws
- B. Add self-locating features and snap-fits
- C. Use unique parts for all components
- D. Increase tolerance variation

47. Why choose aluminium for an electronic enclosure instead of stainless steel?

- A. Aluminium is heavier
- B. Aluminium is magnetic
- C. Aluminium has higher stiffness
- D. Aluminium has lower density and higher thermal conductivity

48. Which feature is most difficult to machine using CNC milling?

- A. Large flat surface
- B. Deep narrow pocket with sharp internal corners
- C. Tapped hole
- D. Chamfered edge

49. CNC routers primarily operate on which type of material?

- A. Only metals
- B. Only plastics
- C. Only ceramics
- D. None of the above.

50. Which G-code is used for XY Plane selection?

- A. G02
- B. G03
- C. G17
- D. G28

51. G21 in a CNC router sets units to:

- A. Inches
- B. Millimetres
- C. Degrees
- D. Revolutions per minute

52. Which skill is MOST important for design sensitivity?

- A. Ability to notice small details and patterns
- B. Ability to memorize specifications
- C. Ability to draw fast
- D. Ability to calculate complex equations

53. In product design, 'empathy' is closely related to:

- A. Technical skill
- B. User understanding
- C. Manufacturing cost
- D. Marketing strategy

54. G04 in G-code programming means:

- A. Return to origin
- B. End program
- C. Start spindle
- D. Dwell

55. Which material has the highest corrosion resistance?

- A. Mild steel
- B. Stainless steel

- C. Copper
- D. PVC

56. Anthropometry in ergonomics refers to:

- A. Body measurements
- B. Heat transfer
- C. Lighting conditions
- D. Material properties

57. The study of how humans interact with machines is called:

- A. Aesthetics
- B. Ergonomics
- C. Manufacturing
- D. Sustainability

58. In ergonomics, the term “reach envelope” refers to:

- A. Maximum load capacity
- B. Area within easy arm reach
- C. Air temperature
- D. Visual field

59. The purpose of jigs and fixtures is to:

- A. Improve product aesthetics
- B. Reduce tensile strength
- C. Change material properties
- D. None of the above

60. Overhang printing in FDM requires:

- A. More infill
- B. Support material
- C. Higher laser power
- D. Lower resolution

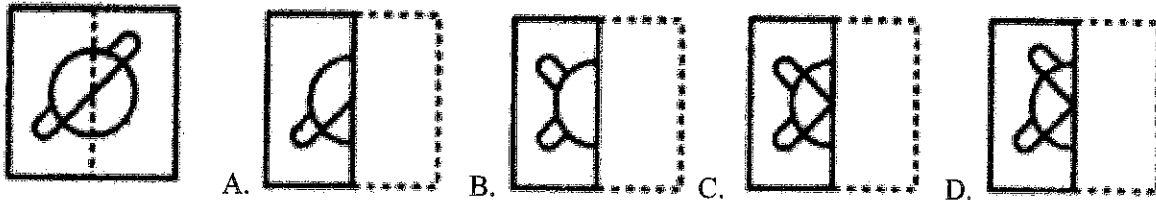
61. The purpose of signal conditioning in instrumentation is to:

- A. Increase noise
- B. Reduce sensor sensitivity
- C. Amplify only DC signals
- D. Convert sensor output into usable form

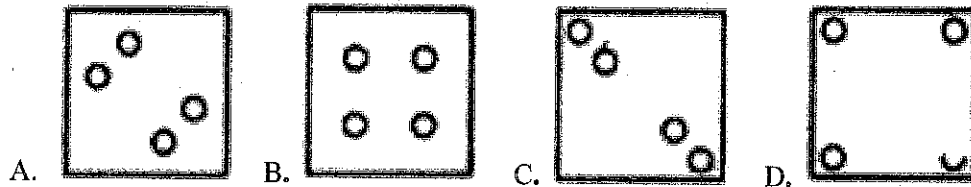
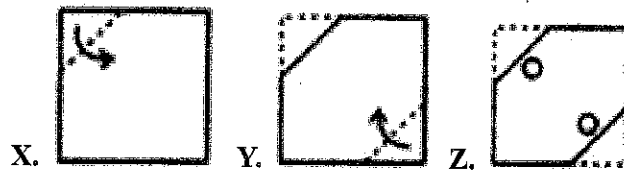
62. The Seebeck effect is the principle of operation of a:

- A. Thermistor
- B. Thermocouple
- C. Strain gauge
- D. Capacitor

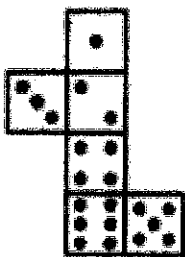
63. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.



64. Choose a figure which would most closely resemble the unfolded form of Figure (Z)



65. When the following figure is folded to form a cube, how many dots lie opposite the face bearing five dots?



- A. 3
- B. 2
- C. 1
- D. 4

66. Look at this series: 8, 22, 8, 28, 8, ... What number should come next?

- A. 9
- B. 29

C. 32

D. 34

67. Which resistive component is designed to be temperature sensitive?

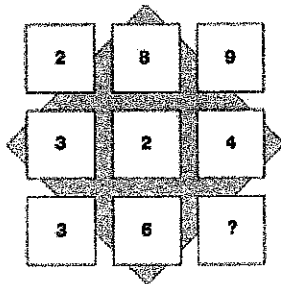
A. Thermistor

B. Rheostat

C. Potentiometer

D. Photo Conductive Cell

68. Which number replaces the question mark?



A. 6 B. 5 C. 4 D. 1

69. A hard disk is divided into tracks which are further subdivided into:

A. Sectors

B. Vectors

C. Heads

D. Clusters

70. What's the best way to protect your hard drive data?

A. Regular Backups

B. Periodically Defrag it

C. Run scan disk list once in a week

D. None of the above.

71. When designing a handle for a tool, which property is MOST critical?

A. Electrical conductivity

B. Thermal expansion

C. Grip and ergonomics

D. High melting point

72. A product that needs to absorb shock (example: helmets) should primarily use materials with:

- A. High brittleness
- B. High elasticity
- C. High thermal conductivity
- D. High density

73. In product design, understanding user problems helps to:

- A. Increase manufacturing time
- B. Reduce market success
- C. Improve material selection
- D. Increase product cost

74. The main advantage of laser cutting over mechanical cutting is:

- A. More noise
- B. More tool wear
- C. No physical contact
- D. Slower cutting speed

75. Which instrument is used to check the flatness of a surface?

- A. Spirit level
- B. Surface plate
- C. Bevel gauge
- D. Dial calliper

76. Feeler gauges are used to measure:

XX

- A. Angles
- B. Depth
- C. Small gaps or clearances
- D. Hardness

77. A diode allows current to flow in:

- A. Only reverse direction
- B. Only forward direction
- C. Both directions
- D. No direction

78. The colour code of a 100Ω resistor with 10% tolerance is:

- A. Brown, Black, Brown, Silver
- B. Brown, Black, Black, Gold

C. Brown, Black, Brown, Gold

D. Red, Black, Brown, Gold

79. Some of the common terms used to describe technical drawing include:

A. Drafting

A. Engineering Graphics

C. Engineering Drawing

D. All of the above

80. Which device generates a periodic waveform?

A. Rectifier

B. Amplifier

C. Oscillator

D. Filter

81. The safest practice when working with chemicals is to:

A. Smell chemicals directly

B. Use chemicals without Gloves

C. Mix random chemicals

D. None of the above

82. The correct way to lift heavy objects in a lab is to:

A. Bend at the waist

B. Lift with the legs

C. Pull using your back

D. Run while lifting

83. Before using any power tool, you should:

A. Read the user manual

B. Ignore safety signs

C. Remove PPE

D. Test the tool on your hand

84. Which memory is volatile and stores data temporarily?

A. Hard disk

B. CD-ROM

C. RAM

D. Pen drive

85. Spreadsheet software mainly processes:

- A. Audio files
- B. Numerical and tabular data
- C. Games
- D. Photos

86. A bar chart is used for:

- A. Audio mixing
- B. Visual representation of data
- C. Writing letters
- D. Increasing RAM

87. If the room *had been brighter*, I would have been able to read for a while before bed time.

- A. If the room was brighter
- B. If the room are brighter
- C. Had the room been brighter
- D. No improvement

88. Which type of saw is best suited for straight wood cutting?

- A. Circular saw
- B. Jig saw
- C. Hack saw
- D. Reciprocating saw

89. Which safety gear is mandatory while using a grinder?

- A. Gloves and Steel toes shoes
- B. Safety goggles
- C. Ear plug
- D. All of the above

90. The zero drift in load cells is caused by:

- A. Noise
- B. Temperature change
- C. Mechanical overload
- D. All of the above

91. Which observation is LEAST relevant when evaluating product ergonomics?

- A. Hand size distribution of target users
- B. Typical tasks and grips used with the product

C. The designer's personal preference for materials

D. Frequency and duration of use

92. Which is the MOST design-sensitive way to prioritize issues found during observation?

A. Fix the first thing you see

B. Rank issues by frequency, severity (safety/criticality), and business/user impact, then address high-impact items first

C. Only fix cosmetic issues

D. Delegate all issues to marketing

93. A metal lid stuck on a glass jar opens easily when hot water is poured on it because:

A. Glass melts

B. Jar becomes slippery

C. Pressure reduces

D. Metal expands faster than glass

94. The average age of seven boys sitting in row facing North is 26 years. If the average age of the first three boys is 19 years and the average age of boys is 32 years, what is the age of the boy who is sitting in the middle of the row?

A. 24 years

B. 28 years

C. 29 years

D. 31 years

95. If the price of a book is first decreased by 25% and then increased by 20% then the net change in the price will be

A. 5% Increase

B. 5% Decrease

C. 10% Decrease

D. 10% Increase

96. If the resistance of a wire is doubled and its length is also doubled, what happens to current for the same voltage?

A. Increases

B. Decreases

C. Becomes zero

D. Remains same

97. Which filter would you choose to reduce reflections from water or glass (for clearer colour and contrast)?

- A. Neutral density (ND) filter
- B. Graduated ND filter
- C. Circular polarizer (CPL)
- D. UV filter

98. Applying for Seasonal Employment occurs when a person requests to be considered for a job that is dependent on a particular season or time of year. Which situation below is the best example of Applying for Seasonal Employment?

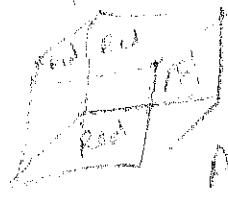
- A. The ski instructors at Top of the Peak Ski School work from December through March.
- B. Matthew prefers jobs that allow him to work outdoors.
- C. Lucinda makes an appointment with the beach resort restaurant manager to interview for the summer waitressing position that was advertised in the newspaper.
- D. Doug's ice cream shop stays open until 11 p.m. during the summer months.

99. Stereolithography is based on which principle?

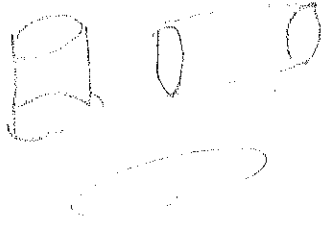
- A. Photopolymerization
- B. Powder bed fusion
- C. Extrusion of thermoplastics
- D. Binder jetting

100. Due to enormous profits involved in smuggling, hundreds of persons have been attracted towards this anti-national activity. Some of them became millionaires overnight. India has a vast coastline both on the Eastern and Western Coast. It has been a heaven for smugglers who have been carrying on their activities with great impunity. There is no doubt, that from time to time certain seizures were made by the enforcement authorities, during raids and ambush but even allowing these losses the smugglers made huge profits. The passage best supports the statement that

- A. smuggling hampers the economic development of a nation.
- B. Illegal smuggling activities should be reduced or prevented.
- C. The government or officials are using strong actions or rules to stop or reduce illegal.
- D. Smuggling is increasing because people can earn quick money from it.



Surface
red
All 6 faces in red



1, 2, 6, 9, 91