



MECHANICAL DRAWING 1
5145

JUNE XXXX

INTERMEDIATE LEVEL

Centre No. & Name	
Candidate No.	
Candidate Name	

Mobile phones are NOT allowed in the examination room.

5145 MECHANICAL DRAWING 1: MULTIPLE CHOICE QUESTION PAPER

1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed "Intermediate Level – 5145 MECHANICAL DRAWING 1.
4. Insert the information required in the spaces above.
5. Insert the information required in the spaces provided on the answer sheet using your HB pencil:
Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number.

Take care that you do not erase or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination:

6. Answer ALL the 50 questions in this Examination. All questions carry equal marks.
7. Each question has FOUR suggested answers: A, B, C and D. Decide which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.
For example, if C is your correct answer, mark C as shown below:
[A] [B] [C] [D]
8. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
9. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
10. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
11. You must not take this booklet and the answer sheet out of the examination room. All question booklets and answer sheets will be collected at the end of the examination.

Turn Over

1. The type of lines at the beginning and at the end of a dimension line is called

- A Phantom lines
- B Cutting plane lines
- C Break lines
- D Extension line

2. In technical drawing, when a visible edge coincide with a hidden edge, which line is used?

- A Hidden line
- B Center line
- C Visible line
- D Phantom line

3. The figure below shows drawing pencils. Give the name of the material that projects at the tip and produces marks on the paper when they are being used.



- A Copper
- B Graphite
- C Plastics
- D Carbon

4. A combination of the three drawing instruments is used to drawing vertical lines on a drawing board

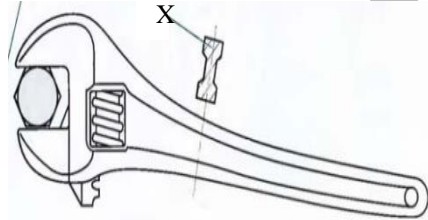
- A T-square, pencil and set square
- B T-square, ruler and pencil
- C T-square, ruler and protractor
- D T-square, compass and ruler

5. The symbol below is used in technical drawing. What does it indicate?



- A Position of the drawing
- B Orientation of reading a drawing on paper
- C Shape of the drawing
- D Size of the drawing

6. The detail labelled X on the figure below shows a type of sectioning. Give its name



- A Half section
- B Full section
- C Revolved section
- D Removed section

7. In sectioning, hatching is used to indicate where cutting has effectively taken place. In the process, all pieces crossed by the cutting plane

- A Must be hatched
- B Should be hatched
- C Could be hatched
- D Are hatched

8. In orthographic projection, how many views are required to clearly define a symmetrical object

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

9. What is the dimension of a line on a drawing having true dimension of 543 mm to a scale of 1/10?

- A 5.43mm
- B 54.3mm
- C 543.0mm
- D 0.543mm

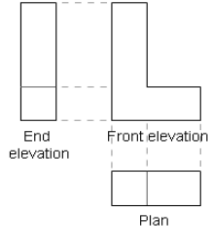
10. The figure below represents a multi viewed part. How does a horizontal surface of a multi view drawing appear in the front view?



- A line
- B Normal surface
- C Point
- D Line and point

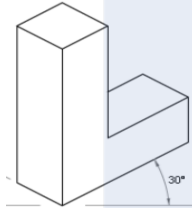
- A Cutting plane
- B Center plane
- C Cutting orientation
- D Symmetrical plane

11. Which of the following pairs of views in orthographic projection both show the dimension of the height



- A End elevation and front
- B Plan and front
- C Plan and end elevation
- D Top and right side

12. In isometric projections as shown below, the three edges of an object are inclined to each other at

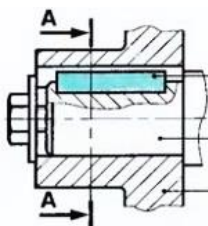


- A 60°
- B 90°
- C 120°
- D 30°

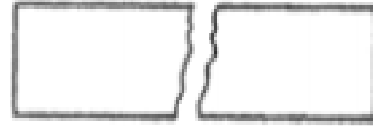
13. It is used to produce a drawing of very large objects compared to the real dimensions of the object.

- A Dimensions
- B Scale
- C Tolerance
- D Lines

14. From the figure below, the line labelled A –A represents a:

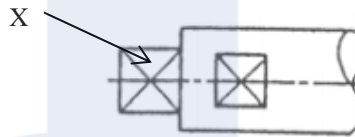


15. The sketch below represents the conventional representation of the interrupted view of a



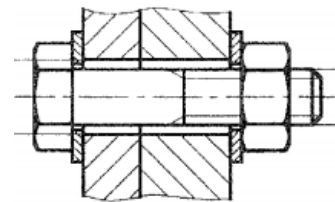
- A Round shaft
- B Prismatic shaft
- C Cylindrical shaft
- D Rectangular shaft

16. The detail indicated by X on a shaft ending represents a



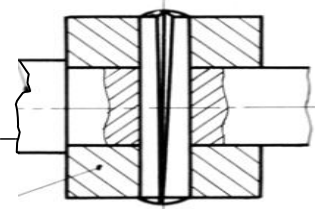
- A Flat feature on 1 side
- B Flat feature on 5 sides
- C Flat feature on 3 sides
- D Flat feature on 4 sides

17. The link between two mechanical parts using mechanical fasteners as shown on the diagram below is



- A Complete, dismantlable and rigid
- B Complete, dismantlable and elastic
- C Complete, not dismantlable and rigid
- D Complete, not dismantlable and elastic

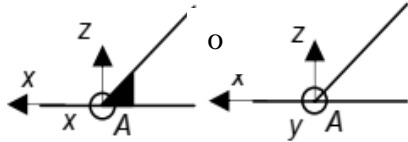
18. The link between the two parts as shown on the diagram is a (an)



Turn over

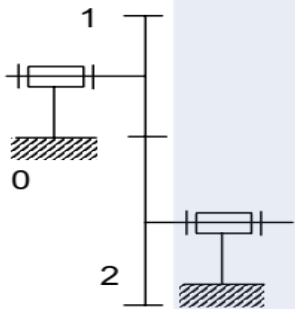
- A Helical link
- B Pivot link
- C Embedded link
- D Sliding link

19. An embedded link, represented by its symbol below has how many degrees of freedom.



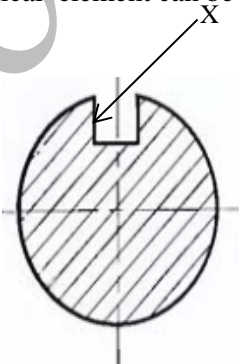
- A 1
- B 2
- C 3
- D 0

20. On the gear line diagram shown below, 1 and 2 represents a



- A Two toothed wheels rotation in the same direction
- B Two toothed wheels rotating in opposite directions
- C Two friction wheels moving in the same direction
- D Two friction wheels moving in opposite directions

21. The feature labelled X on a shaft on which a Mechanical element can be mounted is called



- A Chamfer
- B Narrow pass
- C Keyway
- D Key seat

22. On the drawing below, the detail indicated with the arrow on the shaft is called

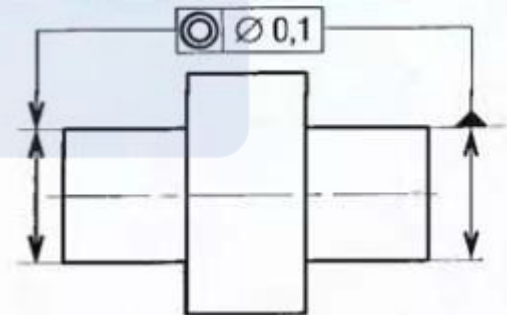


- A Chamfer
- B Groove
- C Thread
- D Knurling

23. In power transmission systems, a reducer has a transmission ratio of

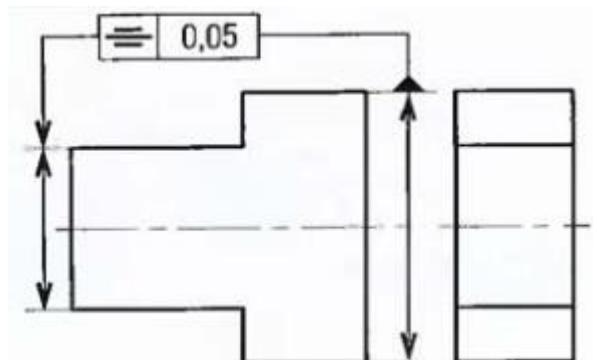
- A Greater than 1
- B Equal to 1
- C Less than 1
- D Approximately equal to 1

24. The geometric tolerance shown below is that of



- A Concentricity
- B Position
- C Perpendicularity
- D Angularity

25. The geometric tolerance shown below is that of :



- A Parallelism
- B Symmetry
- C Perpendicularity
- D Angularity

26. Given the tolerance dimension $\text{Ø}15 \text{ H}7 = 15^{+0.018}_0$. Determine the maximum dimension of $\text{Ø}15 \text{ H}7$.

- A 15,18
- B 15,018
- C 15,0018
- D 15

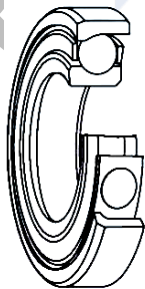
27. Given the tolerance dimension $\text{Ø}15 \text{ H}7 = 15^{+0.018}_0$. Determine the minimum dimension of $\text{Ø}15 \text{ H}7$.

- A 15,18
- B 15,018
- C 15
- D 15,0018

28. When the maximum clearance of a fit is positive and the minimum clearance of the fit is negative, then the fit is said to be :

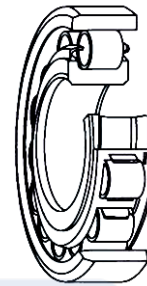
- A Clearance fit
- B Transition fit
- C Force fit
- D Allowance fit

29. In the configuration of ball bearings as shown below, the balls geometrically touch the raceway surfaces of the inner and outer rings at



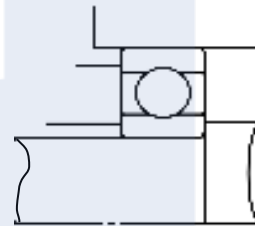
- A Points
- B Lines
- C Surfaces
- D Planes

30. In the configuration of roller bearings as shown below, the rollers geometrically touch the raceway surfaces of the inner and outer rings at



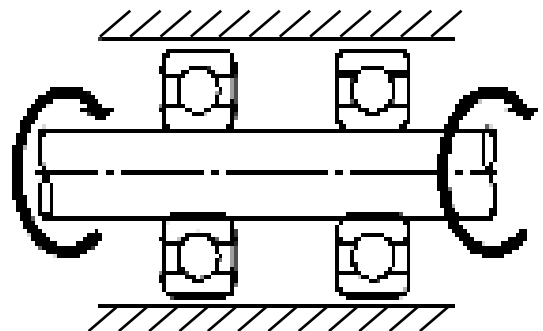
- A Points
- B Lines
- C Surfaces
- D Planes

31. In a mechanical link involving a bearing as shown, the bearing assures



- A Translation guide
- B Transmission of motion
- C Rotational guide
- D Rotational link

32. During the mounting of a rigid ball bearing where it's the shaft to turn under a static load as shown:

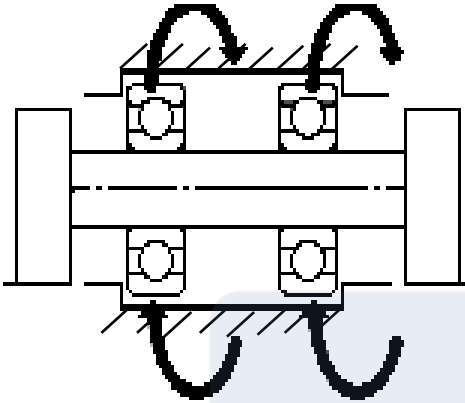


- A The outer and inner rings are mounted

Turn over

- tight.
- B The outer and inner rings are mounted with a transition fit.
- C The outer ring is mounted tight and the inner ring is mounted with a clearance.
- D The outer ring is mounted with a clearance and the inner ring is mounted tight

33. During the mounting of a rigid ball bearing where the shaft is fixed under a static load as shown



- A The outer and inner rings are mounted tight
- B The outer and inner rings are mounted with a transition fit.
- C The outer ring is mounted tight and the inner ring is mounted with a clearance
- D The outer ring is mounted with a clearance and the inner ring is mounted tight.

34. All are the objectives of lubricating bearings except:
- A Increase wear
- B Dissipation of friction heat
- C Reduction of friction
- D Prevention of rust

35. Power transmission by gears is done by:
- A Adherence
- B Obstacle
- C Pressure
- D Friction

36. In an external gear train of only two gears,
- A The two gears turn in opposite directions
- B The two gears turn in parallel directions
- C The two gears turn in the same directions
- D The two gears turn in perpendicular directions

37. Given the tolerance fit: $\text{Ø}15 \text{ H}7/\text{g}6$. Give the significance of the symbol $\text{Ø}15$
- A Diameter of the piece

- B Maximum diameter of the piece
- C Nominal diameter
- D Minimum diameter

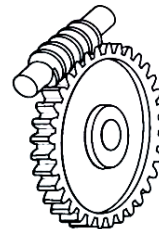
38. A gear tooth must resist fracture during transmission due to light impact. Which property of materials enables it to resist?
- A Elasticity
- B Endurance
- C Strength
- D Toughness

39. In the domain of joining parts by welding, the following are some welding processes except:
- A Resistance welding
- B Bonding
- C Oxyacetylic gas welding
- D Electrical arc welding

40. Amongst the mechanical fasteners listed below, which one cannot be mounted on a shaft
- A Rivets
- B Pins
- C Retaining rings
- D Keys

41. Given the normalized designation of a screw as Screw H M10-25. The letter M signifies:
- A Major diameter
- B Minor diameter
- C Metric threads
- D Module of threads

42. The diagram shown below represents part of a power screw. It is used mostly in:



- A Clutches
- B Jacks
- C Shock absorbers
- D Brake systems

43. Amongst the elements listed below, which of them are assembly elements
- A Bearings
- B Seals
- C Studs

44. A chain of dimension is established as shown on the figure below. What is the name of the lines at the beginning and end of the conditional a?

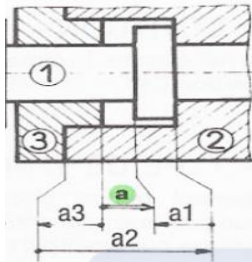
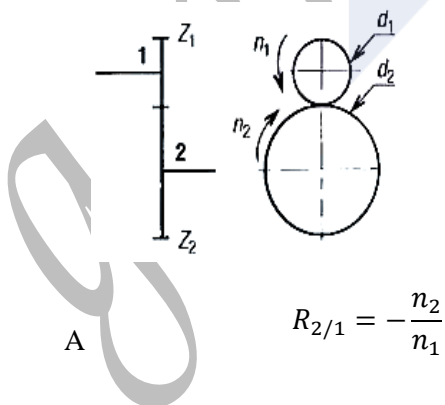


Figure 1

- A Terminal surfaces
 B Conditional surfaces
 C Terminal lines
 D Contact surfaces
45. Using the same diagram on figure 1 above, the equation for a(max) can be written as:
 A $a(\max) = a2(\max) + a3(\min) - a1(\min)$
 B $a(\max) = a2(\min) + a3(\max) - a1(\max)$
 C $a(\max) = a3(\min) + a1(\max) - a2(\max)$
 D $a(\max) = a2(\max) - a1(\min) - a3(\min)$
46. The diagram shows an external gear train where gear 1 is a driving gear. The ratio will be given by

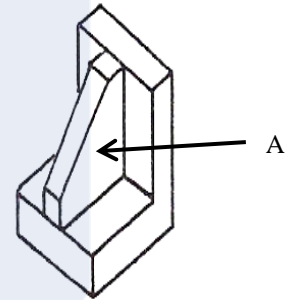


- B $R_{2/1} = \frac{n_2}{n_1}$
 C $R_{2/1} = -\frac{Z_2}{Z_1}$
 D $R_{2/1} = -\frac{d_2}{d_1}$

47. Gears are used for the following reasons except one. Which one?
 A To increase or decrease the distance between shafts
 B To increase or decrease the speed of rotation
 C To move rotational motion to a different axis
 D To keep the rotation of two axis synchronized

48. What type of projection shows the front view in true shape
 A Isometric
 B Perspective
 C Oblique
 D Axonometric

49. The feature indicated by A on the drawing below represents



- A Joint
 B Web
 C Support
 D Link

50. The numerical code of electrical arc welding is
 A 132
 B 21
 C 311
 D 111