



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 2 Examination in Engineering: March 2026

Module Number: ME2302

Module Name: Introduction to Materials Science and
Manufacturing Engineering (C-18)

[One Hour]

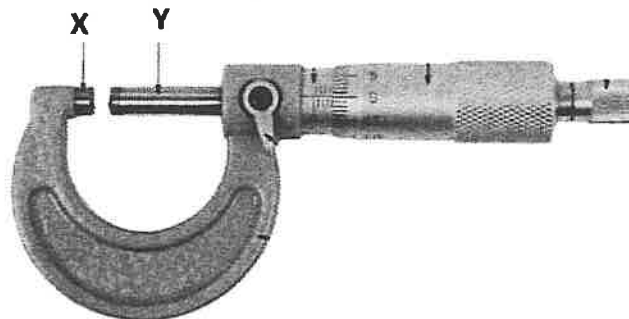
[Answer all questions]

Part A (MCQ)

- This question paper (Part A) contains 30 MCQ questions.
 - Each question has only one answer.
 - For each question, put **X** mark on the letter: a., b., c., or d. which corresponds to the correct answer, by using a black or blue ball-point pen.
 - Mark the answers on provided sheet (Page 5 of Part A).
 - Write your index number on the answer sheet (provided).
 - Part A carries **20.0 marks**.
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- 1) Which of the following is not a requirement of a good pattern?
 - a. It should be light in weight to handle easily
 - b. It should be smooth to make casting surface smooth
 - c. It should have low strength to break it and to remove casting easily
 - d. none of the above
- 2) The patterns which are made in two or more pieces are called as,
 - a. solid patters.
 - b. split patterns.
 - c. loose patterns.
 - d. none of the above.
- 3) Permeability can be defined as the property of moulding sand
 - a. to hold sand grains together.
 - b. to allow gases to escape easily from the mould.
 - c. to withstand the heat of melt without showing any sign of softening.
 - d. none of the above.
- 4) Sprue in casting refers to
 - a. gate.
 - b. runner.
 - c. riser.
 - d. vertical passage.
- 5) Investment casting is used for
 - a. shapes which are made by difficulty using complex patterns in sand casting.
 - b. mass production.
 - c. shapes which are very complex and intricate and can't be cast by any other method.
 - d. stainless steel.

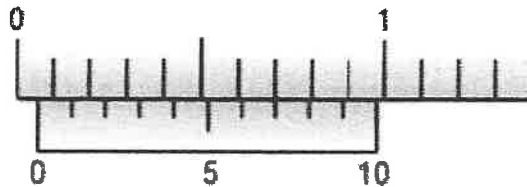
- 6) Which of the following casting methods utilises wax pattern.
- Shell moulding
 - Plaster moulding
 - Slush casting
 - Investment casting
- 7) In gating system, sprue is usually tapered to
- avoid air aspiration effect.
 - quick fill the mould cavity.
 - minimize the temperature.
 - all of the above.
- 8) Which type of surface is produced by turning operation in lathe machine?
- Flat
 - Cylindrical
 - Taper
 - none of the mentioned
- 9) The horizontal feed in a lathe is controlled by;
- apron
 - headstock
 - cross-slide
 - none of the mentioned
- 10) What is the necessary condition for turning?
- The material of workpiece should be harder than the cutting tool
 - Cutting tool should be harder than the material of the workpiece
 - The hardness of the cutting tool and material of piece should be the same
 - none of the mentioned
- 11) Bench vice is a;
- marking device
 - job holding device
 - measuring instrument
 - cutting tool
- 12) Which operation removes burrs from a plate after cutting?
- Brushing
 - Scraping
 - Filing
 - Chiselling
- 13) Name the part marked as 'X' and 'Y'.



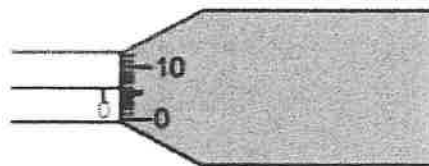
- X-Anvil and Y-spindle
 - X-Spindle and Y-support
 - X-Spindle and Y-ball
 - X-Spindle and Y-Anvil
- 14) Name the instrument used for indirect measurement.
- Steel rule
 - Caliper
 - Vernier caliper
 - Micrometer screw gauge

- 15) The smallest division on main scale of a vernier calliper is 1 mm, and 10 vernier scale divisions coincide with 9 main scale divisions. While measuring the length of a line, the zero mark of the vernier scale lies between 10.2 cm and 10.3 cm and the third division of vernier scale coincide with a main scale division. Find the length of wire:
- 10.03 cm
 - 10.33 cm
 - 10.20 cm
 - 10.23 cm

- 16) The figure shows a situation when jaws of vernier are touching each other, and one main scale division is of 1 mm. The zero correction in reading measured will be:

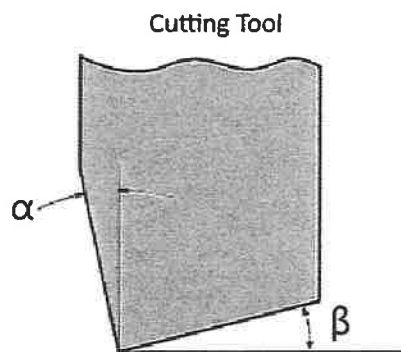


- 0.5 mm
 - 0.7 mm
 - 0.5 mm
 - 0.7 mm
- 17) What is the purpose of using a ratchet screw in the micrometer screw gauge?
- To maintain uniform measuring pressure
 - To reduce wear of screw threads
 - Both the above
 - None of the above
- 18) A micrometer screw gauge has least count (L.C.) = 0.02 mm. When the faces are touching each other, only zero marking of the main scale is visible and 6th division of circular scale is coinciding with the reference line. Find the zero error of the instrument:



- +0.12 mm
 - 0.12 mm
 - +0.6 mm
 - 0.06 mm
- 19) The cutting tool in a milling machine is mounted on;
- spindle.
 - arbor.
 - column.
 - knee.
- 20) Which of the following operations can be performed with milling cutters?
- Cutting key ways on shafts
 - Cutting external screw threads
 - Cutting teeth of spur gears
 - All of these
- 21) Slab milling can be performed more effectively by _____ milling machine.
- horizontal
 - vertical
 - form
 - none of the mentioned

- 22) Milling machine tools has_____.
- single cutting edge
 - double cutting edges
 - multi cutting edges
 - none of the mentioned
- 23) The gear cutting operation in a milling machine by using_____.
- end milling cutter
 - form relieved cutter
 - both End milling & Form relieved cutter
 - none of the mentioned
- 24) Boring can be performed more effectively by_____ milling machine
- horizontal
 - vertical
 - form
 - none of the mentioned
- 25) What is the formula to find tap drill size (TDS) for a general purpose?
- Major diameter minus pitch
 - Major diameter minus $3 \times$ pitch
 - Major diameter minus $2 \times$ pitch
 - Major diameter minus $0.5 \times$ pitch
- 26) What is the tap drill size (TDS) of M10 $\times$ 1.5 tap?
- 10-1.5=8.5 mm
 - 10+1.5=11.5 mm
 - 10-1.5=8.5 cm
 - 10+1.5=11.5 cm
- 27) Why the tap drill size to be calculated?
- To avoid drill breaking
 - To avoid material wastage
 - To calculate sufficient cutting speed
 - To maintain sufficient material to tap
- 28) What is the name of the driving end which is fitted on the machine?
- Lip
 - Heel
 - Flute
 - Shank
- 29) What is α ?



- Positive rake angle
 - Shear angle
 - Relief angle
 - Negative rake angle
- 30) What is β in the figure of Q29?
- Positive rake angle
 - Shear angle
 - Relief angle
 - Negative rake angle

Answer-sheet for the MCQs (Part A)

Index Number.....

Question	Answer		
1)	a.	b.	c.
2)	a.	b.	c.
3)	a.	b.	c.
4)	a.	b.	c.
5)	a.	b.	c.
6)	a.	b.	c.
7)	a.	b.	c.
8)	a.	b.	c.
9)	a.	b.	c.
10)	a.	b.	c.
11)	a.	b.	c.
12)	a.	b.	c.
13)	a.	b.	c.
14)	a.	b.	c.
15)	a.	b.	c.

Question	Answer		
16)	a.	b.	c.
17)	a.	b.	c.
18)	a.	b.	c.
19)	a.	b.	c.
20)	a.	b.	c.
21)	a.	b.	c.
22)	a.	b.	c.
23)	a.	b.	c.
24)	a.	b.	c.
25)	a.	b.	c.
26)	a.	b.	c.
27)	a.	b.	c.
28)	a.	b.	c.
29)	a.	b.	c.
30)	a.	b.	c.