# 2017-ME-'53-65'

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1) A block of length 200 mm is machined by a slab milling cutter 34 mm in diameter. The depth of cut and table feed are set at 2 mm and 18 mm/minute, repectively. Considering the approach and the over travel of the cutter to be same, the minimum estimated machining time per pass is _____ minutes.

2) A sprue in a sand mould has a top diameter of 20 mm and height of 200 mm. The velocity of the molten metal at the entry of the sprue is 0.5m/s. Assume acceleration due to gravity as $9.8m/s^2$ and neglect all looses. If the mould is well ventilated, the velocity (*upto3decimalpointsaccuracy*) of the molten metal at the bottom of the sprue is _____ m/s.

3) Two cutting tools with tool life equations given below are being compared:
   Tool 1: $VT^{0.1} = 150$
   Tool 2:$VT^{0.3}300$
   where V is cutting spped in m/minute and T is tool life in minutes. The breakeven cutting speed beyond which Tool 2 will have a higher tool life is _____ m/minute.

4) He was one of my best _____ and I felt his loss _____.
   a) friend, keenly
   b) friends, keen
   c) friend, keener
   d) friends, keenly

5) As the two speakers became increasingly agitated, the debate becomes _____.
   a) lukewarm
   b) poetic
   c) forgiving
   d) heated

6) A right-angled cone (*withbaseradius5cmandheight12cm*), as shown in the figure below, is rolled on the ground keeping the point P fixed until the point Q (*atthebaseofthecone, asshown*) touches the ground again By what angle (*inradius*) about P does the cone travel?
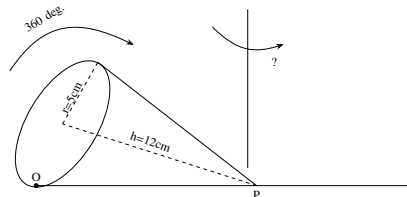

   a) $\frac{5\pi}{12}$
   b) $\frac{5\pi}{24}$
   c) $\frac{24\pi}{5}$
   d) $\frac{10\pi}{13}$

7) In a company with 100 employees, 45 earn Rs.20,000 per month, 25 earn R. 30,000, 20 earn Rs. 40,000, 8 earn Rs. 60,000, and 2 earn Rs. 150,000. The median of the salaries is
   a) Rs. 20,000
   b) Rs. 30,000

c) Rs. 32,300

d) Rs. 40,000

8) P, Q, and R talk about S's car collection. P states that S has at least 3 cars. Q believes that S has less than 3 cars. R indicates that to his knowledge, S has at least one car. Only one of P, Q and R is

a) 0

b) 1

c) 3

d) Cannot be determined

9) "Here, throughout the early 1820s, Stuart continued to fight his losing battle to allow his sepoys to wear their caste-marks and their own choice of facial hair on parade, being again reprimanded by the commander-in-chief. His retort that 'A stronger instance than this of European prejudice with relation to this country has never come under my observations' had no effect on his superiors." According to this paragraph, which of the statements below is most accurate?

a) Stuart's commander-in-chief was moved by this demonstration of his prejudice.

b) The Europeans were accommodating of the sepoys' desire to wear their caste-marks.

c) Stuart's 'losing battle refers to his inability to succeed in enabling sepoys to wear caste-marks.

d) The commander-in-chief was exempt from the European prejudice that dictated how the sepoys were to dress.

10) What is the sum of the missing digits in the subtraction problem below?

$$
\begin{array}{cccccc}
 & 5 & \_ & \_ & \_ & \_ \\
- & 4 & 8 & \_ & 8 & 9 \\
\hline
 & & 1 & 1 & 1 & 1 \\
\end{array}
$$

a) 8

b) 10

c) 11

d) Cannot be determined

11) Let S_1 be the plane figure consisting of the points (x, y) given by the inequalities $|x - 1| \le 2$ and $|y + 2| \le 3$. Let S_2 be the plane figure by the inequalities $x - y \ge -2, y \ge 1$, and $x \le 3$. Let S be the union of S_1 and S_2. The area of S is

a) 26

b) 28

c) 32

d) 34

12) Two very famous sportsmen Mark and Steve happened to be brothers, and played for country K. Mark teased James, an opponent from country E. "There is no way you are good enough to play for your country." James replied, "Maybe not, but at least I am the best player in my own family." Which one of the following can be inferred from this conversation?

a) Mark was known to play better than James

b) Steve was known to play better than Mark

c) James and Steve were good friends

d) James played better than Steve

13) The growth of bacteria (lactobacillus) in milk leads to curd formation. A minimum bacterial population density of 0.8 (in suitable units) is needed to form curd. In the graph below, the population

density of lactobacillus in 1 liter of milk is plotted as a function of time, at two different temperatures, 25 ^0C and 37 ^0C
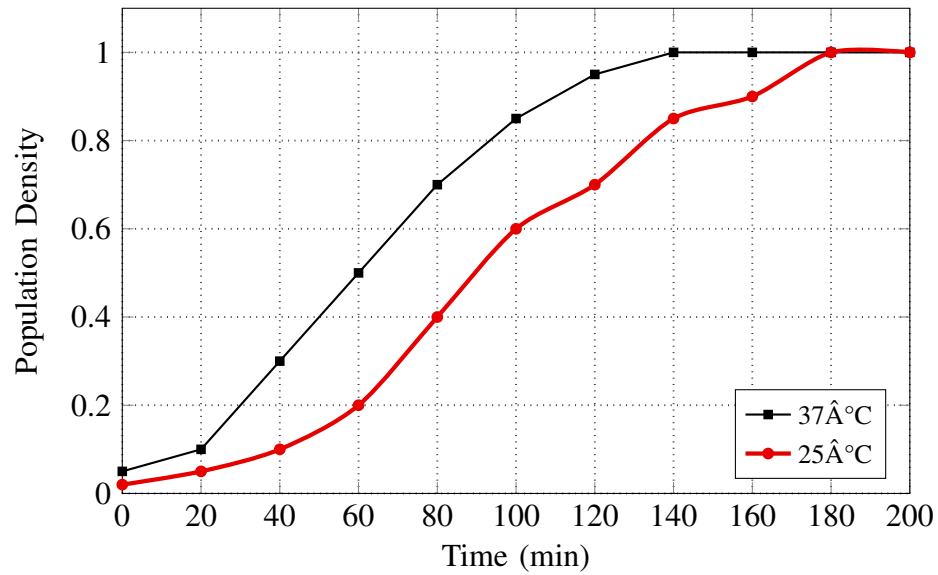
Consider the following statements based on the data shown above:
i. The growth in bacterial population stops earlier at 37 ^{0}C as compared to 25 ^{0}C.
ii. The time taken for curd formation at 25 ^{0}C is twice time taken at 37 ^{0}C Which one of the following options is correct?

a) Only i
b) Only ii
c) Both i and ii
d) Neither i nor ii