GATE CE - 2017

AI24BTECH11001 Abhijeet Kumar

53) The spherical grit particles, having a radius of $0.01mm$ and specific gravity of 3.0, need to be separated in a settling chamber. It is given that
- $g = 9.81m/s^2$
- the density of the liquid in the settling chamber $= 1000kg/m^3$
- the kinematic viscosity of the liquid in the settling chamber $= 10^{-6}m^2/s$

Assuming laminar conditions, the settling velocity (in mm/s, up to one decimal place) is ...

54) Two wastewater streams A and B. having an identical ultimate BOD are getting mixed to form the stream C. The temperature of the stream A is 20° C and the temperature of the stream C is 10° C. It is given that
- the 5-day BOD of the stream A measured at $20°C = 50mg/1$
- BOD rate constant (base 10) at $20°C = 0.115$ per day
- temperature coefficient $= 1.135$

The 5-day BOD (in mg/l, up to one decimal place) of the stream C. calculated at $10°C$ is ...

55) The wastewater having an organic concentration of $54mg/l$ is flowing at a steady rate of $0.8m^3/day$ through a detention tank of dimensions $2m \times 4m \times 2m$. If the contents of the tank are well mixed and the decay constant is 0.1 per day, the outlet concentration (in mg/l, up to one decimal place) is ...

56) The bacteria in milk are destroyed when it ... heated to 80 degree Celsius.

    a) would be   b) will be   c) is   d) was

57) ... with someone else 's email account is now a very serious offence.

    a) Involving   b) Assisting   c) Tampering   d) Incubating

58) Consider the following sentences
All benches are beds. No bed is a bulb. Some bulbs are lamps
Which of the following can be inferred?
  a) Some beds are lamps.
  b) Some lamps are beds.

    a) Only (a)   c) Both (a) and (b)
    b) Only (b)   d) Neither (a) nor (b)

59) If the radius of the right circular cone is increased by 50% its volume increases by

a) 75% b) 100% c) 125% d) 237.5%

60) The following sequence of numbers is arranged in increasing order: $1, x, x, x, y, y, 9, 16, 18$. Given that the mean and median are equal. and are also equal to twice the mode. the value of y is

a) 5 b) 6 c) 7 d) 8

61) The old concert hall was demolished because of fears that the foundation would be affected by the construction of the new metro line in the area. Modern technology for underground metro construction tried to mitigate the impact of pressurized air pockets created by the excavation of large amounts of soil. But even with these safeguards. it was feared that the soil below the concert hall would not be stable. From this, one can infer that

a) the foundations of old buildings create pressurized air pockets underground, which are difficult to handle during metro construction.

b) metro construction has to be done carefully considering its impact on the foundations of existing buildings

c) old buildings in an area form an if possible hurdle to metro construction in that area.

d) pressurized air can be used to excavate large amounts of soil from underground areas

62) Students applying for hostel rooms are allotted rooms in order of seniority. Students already staying in a room will move if they get a room in their preferred list. Preferences of lower ranked applicants are ignored during allocation.
Given the data below. which room will Ajit stay in?

Names	Student Seniority	Current room	Room preference list
Amar	1	P	R, S, Q
Akbar	2	None	R, S
Anthony	3	Q	P
Ajit	4	S	Q, P, R

a) P b) Q c) R d) S

63) The last digit of $(2171)^7 + (2172)^9 + (2173)^{11} + (2174)^{13}$ is

a) 2 b) 4 c) 6 d) 8

64) Two machines $M1$ and $M2$ are able to execute any of four jobs P, Q, R and S. The machines can perform one job on one object at a time. Jobs P, Q, R and S take 30 minutes. 20 minutes. 60 minutes and 15 minutes each respectively. There are 10 objects each requiring exactly 1 job. Job P is to be performed on 2 objects. Job Q on 3 objects. Job R on 1 object and Job S on 4 objects. What is the minimum time needed to complete all the jobs?
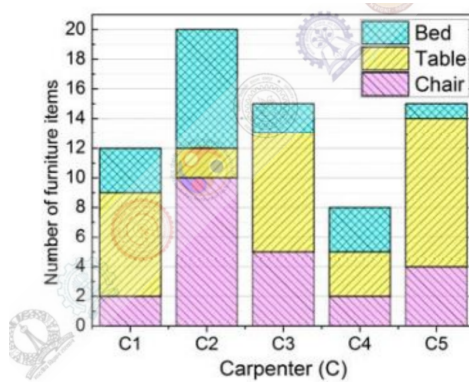
a) 2 hours   b) 2.5 hours   c) 3 hours   d) 3.5 hours

65) The bar graph below shows the output of five carpenters over one month, each of whom made different items of furniture: chairs, tables and beds

Consider the following statements

a) The number of beds made by carpenter C2 is exactly the same as the number of tables made by carpenter C3.

b) The total number of chairs made by all carpenters is less than the total number of tables

Which one of the following is true?

a) Only (a)   c) Both (a) and (b)   (b)

b) Only (b)   d) Neither (a) nor