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### General paper Logic quiz 30

Study the information provided below and answer the questions that follow:

A bus driver intending to travel from Mbadi to Kigo must take into account the following conditions along the route:

- (i) There are roadblocks especially in the mornings.
- (ii) There are usually traffic jams on all exit ways from city between 7.30 am and 9.00am.
- (iii) Wide-load trucks are not allowed to travel in afternoons.
- (iv) The stretch from Hebu to Gestara town is hilly with many sharp bends.
- (v) The loose surface road from Gestara to Kigo is muddy and slippery
- (vi) There are highway robbers in the forest between Gestara and Kigo, Usually after 3.00pm

A bus travelling to Kigo from Mbeti has to cover 398km. it sets off from Mbet at 8.00am and because of heavy traffic, it only manages an average of 40km/hr for a distance of 50km. having got out of traffic jam, the bus now accelerates to 80km/hr up to Tombu which is 98km from Mbeti. From Tombu, the bus slows down behind a wide-load trailer after covering 20km at 80km/hr and remain behind the truck for 30 minutes. The truck is travelling at a paltry 25km/hr. the bus driver at last manages to overtake the truck and accelerate to 120km/hr until he reaches Dantara which is 179km from Mbeti. He continues at the same speed but just 5km before entering Hebu town which is 70km from Dantara he encounters a police roadblock set up to combat highway robbers. Forty-five minutes are spent here while the police make a thorough check of both the passengers and luggage. The bus then covers the 5km to Hebu at a speed at 80km/hr. the next leg of the journey has a hilly terrain and many sharp bends bringing the bus to an average of 60km/hr on the 69km stretch from Hebu to

Gastara town. Here, the passengers spend 15 minutes having refreshments before proceeding at an average of 45km/hr on the muddy and slippery road to Kigo. In The forest between Gestara and Kigo, however, the driver is surprised by another roadblock staged by robbers. He burst through the roadblock, leaving the thugs firing into the air, to enter Kigo triumphantly with a sigh of relief.

### **Questions**

- (a) What is the total time the bus takes to travel from Mbeki to Kigo?  
(show your working)
- (b) Draw a line graph to show the progress of the bus from Mbeki to Kigo.  
Indicate the positions
- (c) Giving reasons for your answer, identify the sections of the journey which are:
  - (i) Most dangerous  
Between
  - (ii) Least dangerous
- (d) Draw up an appropriate travel plan for the driver to arrive at Kigo in the shortest possible time and with least trouble

## Suggested answers

(a) What is the total time the bus takes to travel from Mbeki to Kigo?

(show your working)

### Time spent per segment

Speed =  $\frac{\text{Distance}}{\text{time}}$  or time =  $\frac{\text{Distance}}{\text{speed}}$  or Distance = speed x time

Time spent in jam =  $\frac{50}{40} \times 60 = 75$  minutes

Distance from where the jam stopped to Tombu =  $98 - 50 = 48$  km

Total distance travelled at 80 km/hr =  $20 + 48 = 68$

Time spent from the jam to Tombu =  $\frac{48}{80} \times 60 = 36$

Time spent at 80 km/hr =  $\frac{68}{80} \times 60 = 51$  minutes

Time spent behind the wide-load truck = 30 minutes

Distance travelled along with the truck =  $\frac{25}{60} \times 30 = 12.5$  km

Distance between the point he overtook the truck and Dantara  
=  $179 - (98 + 20 + 12.5)$   
= 48.5 km

Time spent to travel 48.5 km =  $\frac{48.5}{120} \times 60 = 24.25$  minutes

Distance between Dantara and roadblock =  $70 - 5 = 65$  km

Time spent between Dantara and the roadblock =  $\frac{65}{120} \times 60 = 32.5$  minutes

Time spent at the roadblock = 45 minutes

Time taken between roadblock and Hebu =  $\frac{5}{80} \times 60 = 3.75$  minutes

Time spent between Hebu and Gestara =  $\frac{69}{60} \times 60 = 69$  minutes

Time spent at Gestara town = 15 minutes

Distance between Mbeki and Gestara =  $179 + 70 + 69 = 318$  km

Distance from Gestara to Kigo =  $398 - 318 = 80$  km

Time taken from Gestara to Kigo =  $\frac{80}{45} \times 60 = 106.67$  minutes

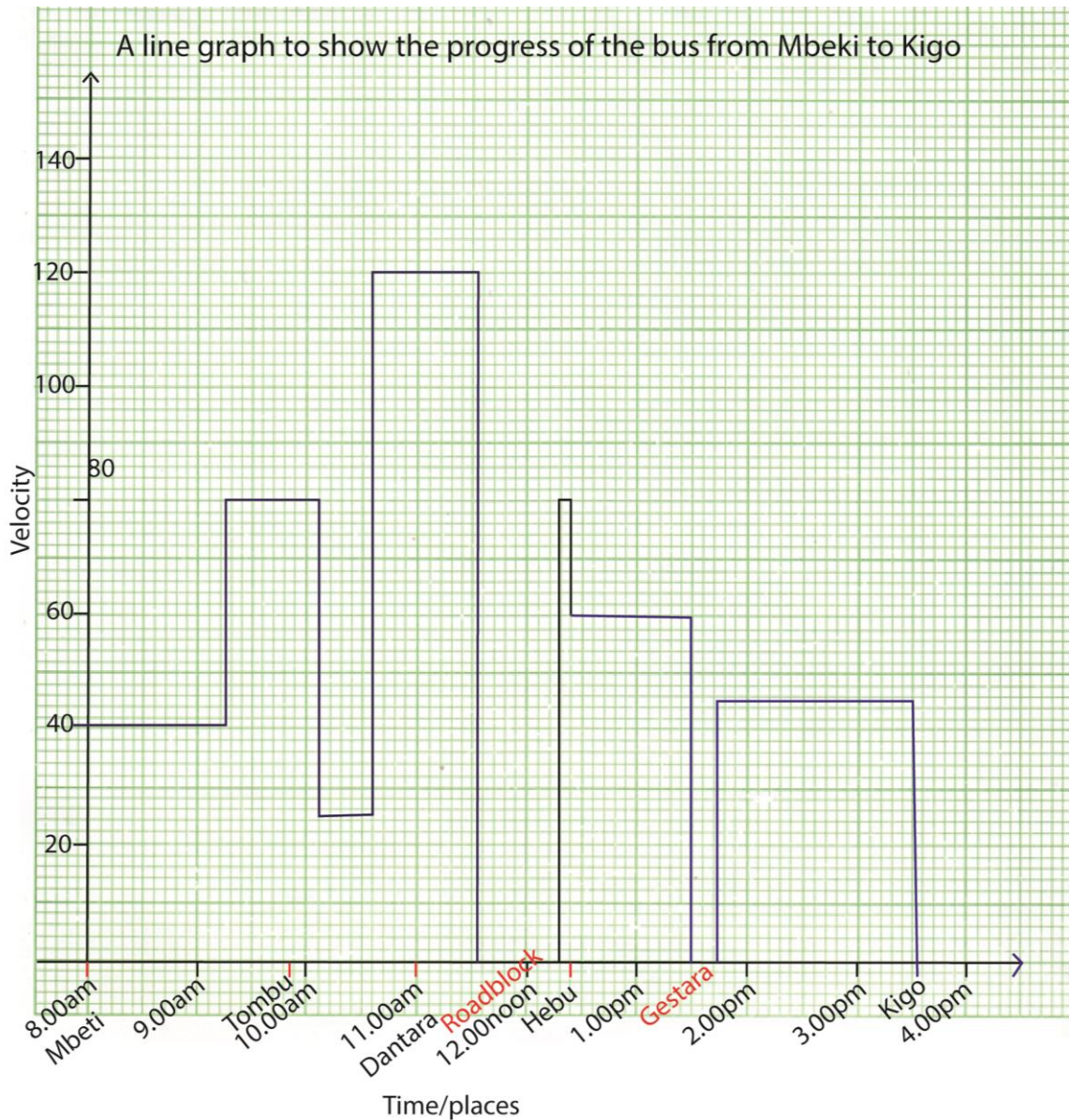
Total time taken between Mbeki to Kigo

=  $75 + 51 + 30 + 24.25 + 32.5 + 45 + 3.75 + 69 + 15 + 106.67$

= 452.17 minutes

= 7 hours and 32.17 minutes

(b) Draw a line graph to show the progress of the bus from Mbeki to Kigo. Indicate the positions



(c) Giving reasons for your answer, identify the sections of the journey which are:

(i) Most dangerous

Between Gestara and Kigo has muddy and slippery road and high incidence of robbers

(ii) Least dangerous

Between Dantara and Hebu because the road is clear

(d) Draw up an appropriate travel plan for the driver to arrive at Kigo in the shortest possible time and with least trouble

From 9.00am and 5.00pm because from 9.00 he dodges jam and between 9.00am and 5.00pm is day time

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Thank You

Dr. Bbosa Science