AVAILABILITY AND DEMAND FOR VARIOUS CATEGORIES OF STEEL IN INDIAN RAILWAYS (in '000 tonnes)

S. No.	Category	1999-2000		2003-2004	
		Demand	Availability	Demand	Availability
1.	Shapes	6960	5725	9745	9360
2.	Flats	4360	5020	6300	6600
3.	Railway material	400	550	450	560

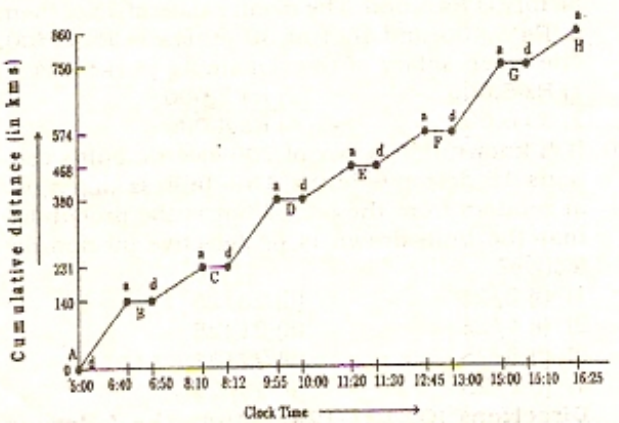
121. If the demand for each category of steel is to be met in 2003-04, then the additional quantity of steel that is to be produced is
I. 110 thousand tonnes of railway material
II. 300 thousand tonnes of flats
III. 385 thousand tonnes of shapes
1) I only 2) III only
3) II only 4) Both II and III

122. The expected percentage growth in the demand for railway material over the five-year period from 1999-2000 to 2003-04 is
1) 11 2) 1/8 3) 37.5 4) 12.5

123. The percentage change in the shortfall of shapes over the five-year period from 1999-2000 to 2003-04 is expected to be
1) + 40 2) + 221 3) – 68 4) –221

124. Which one of the following statements is necessarily true?
1) The demand for shapes as a percentage of the total demand for steel was almost the same for 1999-2000 and 2003-04.
2) The shortage of shapes is only due to excess availability of flats and railway material.
3) The demand for railway materials as a percentage of the total demand for steel was less in 1999-2000 than in 2003-04.
4) The rate of growth in demand for shapes is greater than the rate of growth in supply of shapes.

Directions (Q. 125-128): Study the following line graph to answer these questions.



Railway Time Schedule of an Express Train X Running Between City A and City H

a → Arrival of train

d → Departure of train

A, B, C, D, E, F, G and H → Cities through which the train runs.

a – d → Indicates stoppage/halting of the train at the city station.

125. The average speed the train maintained between two successive stations was maximum between
1) E – F 2) F – G
3) G – H 4) Both G-H and F-G

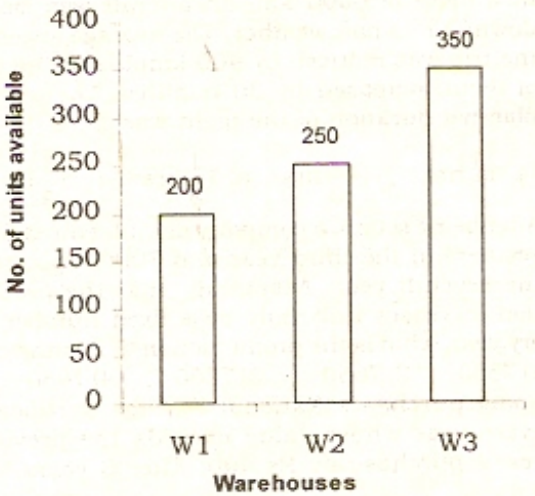
126. Between how many pairs of consecutive stations does the speed run below the overall average speed of the entire trip?
1) 4 2) 1
3) 3 4) 2

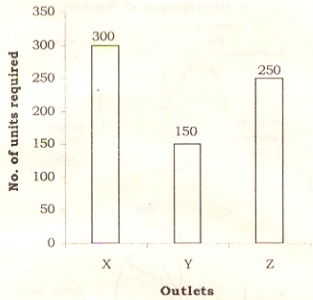
127. If the train stops at each city for 30% more time than what it is at the moment, then at what time will it reach the city H after departing from City A as per schedule?
1) Data insufficient 2) 17 : 03
3) 16 : 41 4) 16 : 58

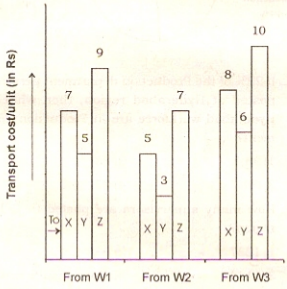
128. The train begins its onward journey from City A and it is extended to beyond City H to a City M due to some unavoidable reason. The train starts its return journey immediately after it reached City M. The train returns with a speed of 90 km/hr without any stoppages in between and reaches City A at 2 : 25 AM. Find the distance between City H and City M.
1) 40 km 2) 90 km
3) 70 km 4) 10 km

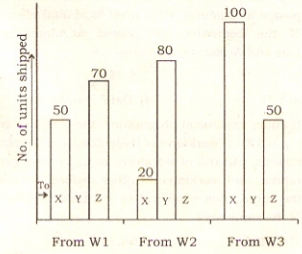
Directions (Q. 129-132): Examine the following bar graphs to answer these questions.

TRANSPORTATION SCHEDULE OF A COMPANY FROM ITS WAREHOUSES TO ITS OUTLETS









129. If only warehouse W2 was available, then the minimum cost at which it can supply all the quantity available is
1) Rs 1,750 2) Rs 750
3) Rs 1,250 4) Rs 950

130. If each warehouse is allowed to supply to only one outlet so that the quantity required for the outlet is fully met from the quantity available at the warehouse, then the cost to be incurred is
1) Rs 4,900 2) Rs 5,000
3) Rs 5,500 4) Rs 4,700

131. If the outlet Y alone is available, then cost of transporting 100 units from each of the warehouses W1, W2, W3 is
1) Rs 1,500 2) Rs 2,000
3) Rs 1,400 4) Rs 1,600

132. If goods in W1 are rejected due to manufacturing defect and the corresponding supplies are made from W3, then the cost incurred in transporting the shipped quantity is
1) Rs 2,620 2) Rs 2,740
3) Rs 2,670 4) Rs 2,690

Directions (Q. 133-136): Study the following table to answer these questions.

PROJECTED POPULATION OF LIGHT MOTOR VEHICLES (IN MILLIONS)

S.No.	Country	1975	2030
1.	United States	141	382
2.	Japan	120	238
3.	France	67	164
4.	China	63	117
5.	Italy	18	61
6.	Germany	21	58
7.	UK	15	47
8.	Canada	5	17
9.	Switzerland	1.5	3

133. The average population of LMVs of the middle three countries in 1975 bears to the average population of LMVs of the last three countries a ratio of nearly
1) 19 : 4 2) 11 : 3 3) 7 : 2 4) 5 : 1

134. The percentage growth of the average population of LMVs for the last three countries between the years 1975 and 2030 is approximately
1) 71 2) 212 3) 172 4) 221

135. For China, assuming a linear growth in LMVs population, extrapolate nearly, when will the growth in population be 108% beyond the year 2030?
1) 2048 2) 2050 3) 2032 4) 2038

136. The percentage growth of the projected LMVs population between 1975 and 2030 among the last five countries is maximum in
1) Italy 2) Switzerland
3) Canada 4) UK

Directions (Q. 137-140): Study the following table to answer these questions.

ALLOTMENT OF SHARES BY A MULTINATIONAL COMPANY

No. of Shares Applied for	No. of Shares Allotted	Ratio of Allottees to Applicants	No. of Allottees
100	100	1:50	8001
200– 500	100	2:41	7624
600– 900	200	1:15	6202
1000– 3000	200	3 : 28	1515
3100 – 10000	200	1 : 6	1633
10200 – 21000	300	2 : 5	404
25000	350	1 : 1	11

137. Find the total number of applicants who had applied for 3100-25000 shares.
1) 2048 2) 10819
3) 445 4) 7562

138. Find the average number of shares allotted to an allottee?
1) 100 2) 150
3) 140 4) 200

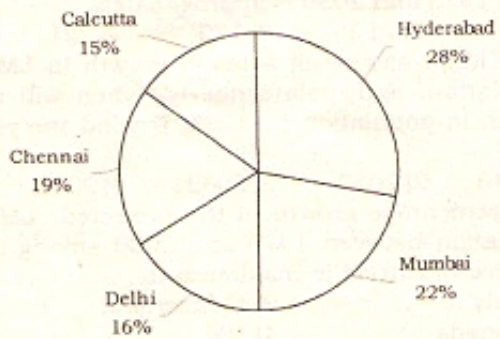
139. Find the ratio between the number of applicants who applied for 1000-3000 shares and those for 10200-21000 shares.
1) 56 : 15 2) 15 : 56
3) 70 : 3 4) 14 : 1

140. If the face value of a share is Rs 100 and the company wanted a subscription of 1 lakh rupees, then how much was it oversubscribed?
1) Rs 45,000 2) Rs 4,500
3) Rs 15,000 4) Rs 10,000

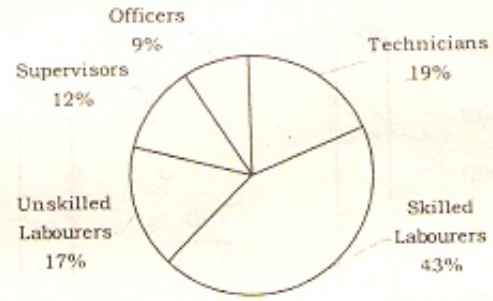
Directions (Q. 141-144): Study the following pie-charts to answer these questions.

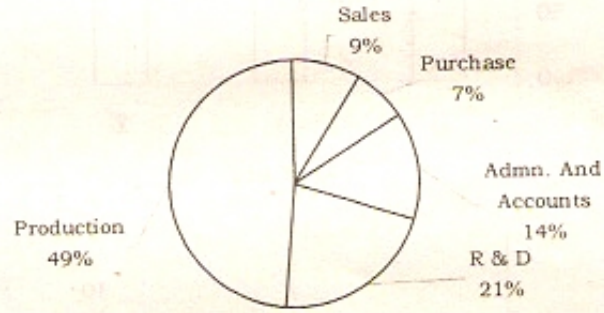
Distribution of Workforce in a company

% Distribution



% Distribution of Workforce





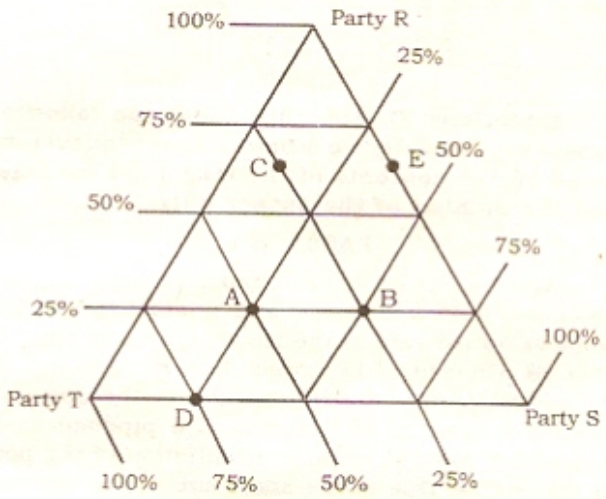
141. If 22% of the Production department persons are posted at Hyderabad region, then what % of Hyderabad workforce are in Production department?
1) 38.5 2) 78
3) 68 4) 22

142. How many supervisors are posted in Calcutta region?
1) 1237 2) 985
3) 1144 4) Data insufficient

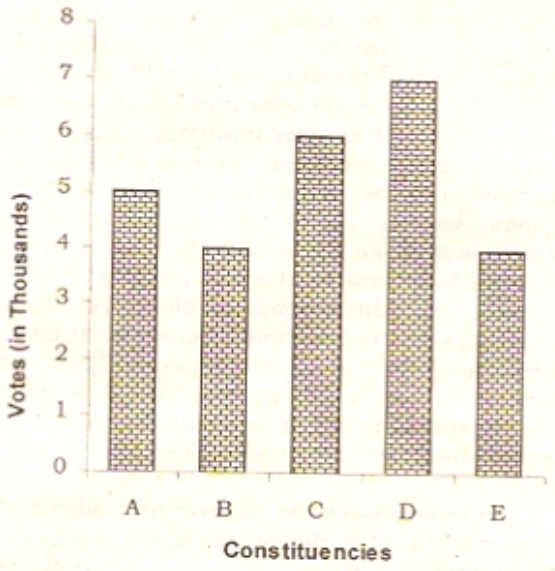
143. If 11% officers of the company are in Administration and Accounts department of which 75% are posted at Calcutta, then what % of total officers of the company are posted at Administration and Accounts, Calcutta?
1) U 2) 8.25
3) 3.75 4) Data insufficient

144. If under expansion programme, the company recruits 12% of workforce of Hyderabad and Mumbai regions, but 6% of workforce of Calcutta region retires, and workforce at other regions remains the same, then what will be the total workforce of the company?
1) 65,196 2) 68,238
3) 72,204 4) 69,430

Directions (Q. 145-148): These questions are based on the triangular diagram and bar diagram given below. Study them carefully and answer.



The above triangle diagram shows the distribution of votes among three parties R, S and T in five different constituencies in an election. The following diagram shows the total votes cast for the three parties in these five constituencies.



145. The constituency which casts more votes for S than for T is
1) A 2) C 3) B 4) D

146. Which constituencies cast the same number of votes for Party R?
1) A, B 2) B, E
3) B, C 4) None of these

147. Total number of votes secured by T in the five constituencies together is
1) 2,000-4,000 2) 8,000-10,000
3) 4,000-6,000 5) 10,000-12,000

148. If no party was voted by less than 25% or more than 50% of the total number of votes in the five constituencies, then the total number of voters in the five constituencies should be between
1) 20,000 and 31,000 2) 21,000 and 31,400
3) 20,500 and 31,200 4) 21,500 and 32,000

Directions (Q. 149-152): Each of these questions is accompanied by three statements A, B and C.You have to determine which statement(s) is/are sufficient/necessary to answer the given question.

149. Find three positive consecutive even numbers.
A. The average of four consecutive even numbers starting from the last of the given numbers is 17.
B. The difference of the highest and the lowest number is 4.
C. The sum of the squares of the three numbers is 440.
1) A alone is sufficient
2) C is sufficient
3) A and B are sufficient
4) Either A or C is sufficient

150. Sonu's income is how much more than Monu's ?
A. Sonu's income is 30% less than her husband's whose provident fund deduction at the rate of 5% is Rs 975 per month.
B. Monu spends 30% of her income on house rent, 15% of which is electricity bill.
C. Sonu's expenditure on house rent is Rs 4,500 more than that of the Monu's.
1) Only B and C are sufficient
2) Any two statements are sufficient
3) Only A and C are sufficient
4) Even all together are not sufficient

151. Find out the share of B out of the combined share of A, B and C of Rs 946.
A. The share of A is 2/9 of the combined share of B and C.
B. The share of B is 3/19 of the combined share of A and C.
C. The share of C is 2.143 times the combined share of B and A.
1) Only statements A and C are sufficient
2) Only statement B is sufficient
3) Any two statements are sufficient
4) Either statements A and C together or B alone is sufficient

152. Mohan is 6 years older than Sohan. What will be the sum of their present ages?
A. After 6 years, the ratio of their ages will be 6 : 5.
B. The ratio of their present ages is 5 : 4.
C. 6 years ago, the ratio of their ages was 4 : 3.
1) Only B is sufficient
2) Only A is sufficient
3) Only A and C together are sufficient

4) Any one of A, B and C is sufficient

Directions (Q. 153-156): Each of these questions consists of a question and the two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the given question. Read both the statements and give answer as

1) if the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer.
2) if the data either in statement I alone or in statement II alone are sufficient to answer the question.
3) if the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer.
4) if the data even in both the statements I and II together are not sufficient to answer the question.

153. In a two-digit number, the digit at unit's place is 4 more than the digit at the ten's place. Find the two-digit number.
I. Sum of their digits is 10.
II. The difference between the number and the number obtained by interchanging the positions of the digits is 36.

154. What is the average age of the children in a class?
I. The age of the teacher is as many years as the number of children.
II. The average age increases by 1 year if the teacher's age is also included.

155. Which newspaper has the maximum circulation in Delhi?
I. 2 lakh copies of newspaper X are sold in Delhi while the circulation of newspaper Y is estimated at 3 lakh.
II. The circulation of newspaper Y is 55 per cent of the total circulation of newspapers.

156. What is the difference between the shares of profits of Rekha and Nutan out of a profit of Rs 6000 at the end of the year?
I. Rekha invested Rs 50,000 and withdrew Rs 1,000 after 4 months.
II. For the last 8 months, Nutan's capital was 125% of the Rekha's.

Directions (Q. 157-160): These questions consist of two quantities, one in Column A and one in Column B. You are to compare the two quantities. Mark the answer as

1) if the quantity in Column A is greater;
2) if the two quantities are equal;
3) if the quantity in Column B is greater;
4) if the relationship cannot be determined from the information given.

	Column A	Column B
157.	$(-3)^8$	$(-3)^9$
158.	$9 \times 682 \times 7$	$10 \times 682 \times 6$
159.	$c^2d^2e^2/c^3d^3e^3$	cde/3
160.	0.0005	$\frac{1}{2}\%$

Directions (Q. 161-180): Read the following passages carefully to answer these questions based on the contents of the respective passages and the opinion of the author only.

PASSAGE-I

Agriculture dominates change in India through its causal links with factor and product markets. It employs 60 per cent of the labour force and contributes 26 per cent of the gross domestic product. In the poorer states, its contribution to the domestic product is close to 40 per cent. Low productivity in agriculture has led to the concentration of the poor in this sector. Due to the sheer size of the agricultural economy and the importance of its major products (cereals) in the diets of the poor, gains in agricultural productivity have significant potential impact on poverty. Theoretically, it is possible to reduce poverty as well as expand the domestic market for industry by raising labour productivity in agriculture and spreading its gains among the low income groups. Modelling of the linkages between agricultural and industrial growth has shown that a 10 per cent increase in agricultural output would increase industrial output by 5 per cent and urban workers would bsnefit by both increased industrial employment and price deflation. However, there is a symmetry of adjustments in the demand and supply of agricultural goods. An increase in non-agricultural production would lead to an immediate increase in demand for intermediate and final agricultural goods, whereas supply-side adjustments involving re-allocation of resources and net additional investment for capacity expansion take a much longer period. There is a widely held view that in a large country like India, the demand stimulus for industrialisation would come mainly from agriculture with less social and economic costs.

Interdependencies in food and labour markets are important for the development process. An upward shift in the food supply curve would simultaneously result in an upward shift in the labour demand curve. The magnitude of the interdependence depends on the technique of production causing the shifts in the food supply curve. Similarly, an upward shift in the labour supply curve shifts up the food demand curve. The extent of interdependence between the forces of labour supply and food demand depends on the employment output elasticity and the income elasticity of demand for food. The recent esti-

mate of the employment output elasticity in agriculture is around 0.5, income elasticity of food is in the range of 0.55-0.60 and that for cereals is 0.25-0.30. The other important inter-dependency, which plays a crucial role in inducing indirect employment, is that between food and other sectors through demand linkages. Since food accounts for a major share in the budget of the poor and any reduction in the food price levels a significant proportion of income for other items, a lower food price stimulates employment in industrial and service sectors. On the other hand, an increase in the food price would increase the wage costs of industrial products and hence the prices of industrial products. In the absence of adjustments through exports, it would result in demand deficiency. Clearly, the most favourable situation in India is one in which labour demand outpaces its supply and food supply outpaces its demand.

Wage rate cannot fall below a certain minimum determined by the costs of subsistence living and the labour supply curve turns elastic at the subsistence wage rate. Demographic pressure cannot push the wage rate below the subsistence level. People would be willing to starve rather than work unless the energy expended in physical work is compensated by the energy provided by food. Foodgrain price usually determines the subsistence wage rate in agricultural as well as in the urban informal sector since foodgrains account for about four-fifth of the calorie intake of the poor.

161. Which of the following is meant by "the labour supply curve turns elastic at the subsistence wage rate" as used in the passage?
    1) People refuse to work at the minimum wage rate.
    2) People are eager to work at the minimum wage rate.
    3) People still work at the minimum wage rate.
    4) People have no option but to work at the minimum wage rate.
162. Which of the following statements is not true in the context of the passage?
    1) Increase in labour productivity in agriculture can reduce poverty.
    2) Agricultural sector can increase the demand for labour forces.
    3) Agricultural sector can provide the impetus for greater industrialisation at lower cost.
    4) All of the above are true
163. Which of the following in addition to employment output elasticity, according to the passage, creates indirect employment?
    1) Inter-linkage of demand of food and other sectors.
    2) Income elasticity of demand for food
    3) Inter-dependence of forces of labour supply and food demand
    4) All of the above
164. Why, according to the passage, does lower food price stimulate employment in the industrial and service sectors?
    1) Poorer people cannot afford to buy non-food products.
    2) The production cost of non-agricultural products and services reduces.
    3) Lower price of food items provides the poor with extra funds to buy other products and services.
    4) Industrial sector can afford to employ more people at lower cost.

PASSAGE-II

The lithosphere, or outer shell, of the earth is made up of about a dozen rigid plates that move with respect to one another. New lithosphere is created at mid-ocean ridges by the upwelling and cooling of magma from the earth's interior. Since new lithosphere is continuously being created and the earth is not expanding to any appreciable extent, the question arises: What happens to the "old" lithosphere?

The answer came in the late 1960s as the last major link in the theory of sea-floor spreading and plate tectonics that has revolutionised our understanding of tectonic processes, or structural deformation, in the earth and has provided a unifying theme for many diverse observations of the earth sciences. The old lithosphere is subducted, or pushed down, into the earth's mantle the thick shell of red-hot rock beneath the earth's thin, cooler crust and above its metallic, partly melted core). As the formerly rigid plate descends, it slowly heats up and over period of millions of years, it is absorbed into the general circulation of the earth's mantle.

The subduction of the lithosphere is perhaps the most significant phenomenon in global tectonics. Subduction not only explains what happens to old lithosphere but also accounts for many of the geologic processes that shape the earth's surface. Most of the world's volcanoes and earthquakes are associated with descending lithospheric plates. The prominent island arcs—chains of islands such as the Aleutians, the Kuriles, the Marianas, and the islands of Japan—are surface expressions of the subduction process. The deepest trenches of the world's oceans, including the Java and Tonga trenches and all others associated with island arcs, mark the seaward boundary of subduction zones. Major mountain belts, such as the Andes and the Himalayas, have resulted from the convergence and subduction of lithospheric plates.

To understand the subduction process, it is necessary to look at the thermal regime of the earth. The temperatures within the earth at first increase rapidly with depth, reaching about 1,200 degrees Celsius at a depth of 100 kilometres. Then they increase more gradually, approaching 2,000 degrees C at about 500 kilometres. The minerals in peridotite, the major constituent of the upper mantle, start to melt at about 1,200 C, or typically at a depth of 100 kilometres.

Under the oceans, the upper mantle is fairly soft and may contain some molten material at depths as shallow as 80 kilometres. The soft region of the mantle, over which the rigid lithospheric plate normally moves, is the asthenosphere. It appears that in certain areas, convection currents in the asthenosphere may drive the plates and that in other regions, the plate motions may drive the convection currents.

Several factors contribute to the heating of the lithosphere as it descends into the mantle. First, heat simply flows into the cooler lithosphere from the surrounding warmer mantle. Since the conductivity of the rock increases with temperature, the conductive heating becomes more efficient with increasing depth. Second, as the lithospheric slab descends, it is subjected to increasing pressure, which introduces heat of compression. Third, the slab is heated by the radioactive decay of uranium, thorium and potassium, which are present in the earth's crust and add heat at a constant rate to the descending material. Fourth, heat is provided by the energy released when the minerals in the lithosphere change to denser phases, or more compact crystal structures, as they are subjected to higher pressures during descent. Finally, heat is generated by friction, shear stresses and the dissipation of viscous motions at the boundaries between the moving lithospheric plate and the surrounding mantle. Among all these sources, the first and fourth contribute the most toward the heating of the descending lithosphere.

165. According to the passage, which of the following statements is/are true of the earth's mantle?
I. It is in a state of flux.
II. Its temperature far exceeds that of the lithosphere.
III. It eventually incorporates the subducted lithosphere.
1) I only 2) I and III only
3) II only 4) I, II and III

166. It can be inferred from the passage that the author regards current knowledge about the relationship between lithosphere plate motions and the convection currents in the asthenosphere as
1) Obsolete 2) Derivative
3) Unfounded 4) Tentative

167. The author is most probably addressing which of the following audiences?
1) Geothermal researchers investigating the asthenosphere as a potential energy source
2) College undergraduates enrolled in an introductory course on geology
3) Historians of science studying the origins of plate tectonic theory
4) Graduate students engaged in analysing the rate of sea-floor spreading

168. Which of the following is not true of the heating of the lithosphere as it is described in the passage?
1) The temperature gradient between the lithosphere and the surrounding mantle enables heat to be transferred from the latter to the former.
2) The more the temperature of the lithospheric slab increases, the more conductive the rock itself becomes.
3) Minerals in the lithospheric slab release heat in the course of phase changes that occur during their descent into the mantle.
4) The further the lithospheric slab descends into the mantle, the faster the radioactive decay of elements within it adds to its heat.

PASSAGE-III

It is indisputable that in order to fulfil its many functions, water should be clean and biologically valuable. The costs connected with the provision of biologically valuable water for food production, with the maintenance of sufficiently clean water, therefore, are primarily production costs. Purely "environmental" costs seem to be in this respect only costs connected with the safeguarding of cultural, recreational and sports functions which the water courses and reservoirs fulfil both in nature and in human settlements.

The pollution problems of the atmosphere resemble those of the water only partly. So far, the supply of air has not been deficient as was the case with water, and the dimensions of the airshed are so vast that a number of people still hold the opinion that air need not be economised. However, scientific forecasts have shown that the time may be already approaching when clear and biologically valuable air will become problem No.1.

Air being ubiquitous, people are particularly sensitive about any reduction in the quality of the atmosphere, the increased contents of dust and gaseous exhalations, and particularly about the presence of odours. The demand for purity of atmosphere, therefore, emanates much more from the population itself than from the specific sectors of the national economy affected by a polluted or even biologically aggressive atmosphere.

The households' share in atmospheric pollution is far bigger than that of industry which, in turn, further complicates the economic problems of atmospheric purity. Some countries have already collected positive experience with the reconstruction of whole urban sectors on the basis of new heating appliances based on the combustion of solid fossil fuels; estimates of the economic consequences of such measures have also been put forward.

In contrast to water, where the maintenance of purity would seem primarily to be related to the costs of production and transport, a far higher proportion of the costs of maintaining the purity of the atmosphere derives from environmental consideration. Industrial sources of gaseous and dust emissions are well known and classified; their location can be accurately