

## ISC Class 12 Economics Specimen Paper 1

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**Maximum Marks: 80 | Time Allowed: Three hours | Reading Time: 15 minutes**

Both Sections are compulsory. Within each Section, attempt any two of the three long questions.

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### General Instructions

Write your answers on the separate answer paper provided. The first 15 minutes are for reading the paper, and you may not write during that time. Both Section A and Section B are compulsory. In Section A attempt Question 1, Questions 2 to 5, and any two of Questions 6, 7 and 8. In Section B attempt Question 9, Questions 10 to 13, and any two of Questions 14, 15 and 16. Marks for each question, or part of a question, are shown in brackets. All working for numerical questions must be shown as part of the answer. No diagram, curve or graph is printed in this paper, and wherever a question asks for one you must draw it yourself in pencil, label both axes and name every curve you show. Amounts are in rupees unless something else is stated. This paper carries 80 of the 100 marks for the subject, the remaining 20 being for the project work.

### SECTION A: MICROECONOMICS (40 Marks)

#### Question 1 [8]

Each part carries 1 mark. For the parts that offer four choices, write only the option you choose. For the rest, answer in a single sentence or give the single word, term or value asked for.

- (i) A point lying inside a production possibility curve shows that the economy is:
  - (a) using all its resources fully and efficiently
  - (b) producing beyond its present capacity
  - (c) leaving some of its resources idle or using them inefficiently
  - (d) growing
- (ii) Define opportunity cost.
- (iii) The marginal utility a consumer derives from a commodity becomes zero at the point at which:
  - (a) total utility is at its highest
  - (b) marginal utility is at its highest
  - (c) total utility begins to rise
  - (d) total utility is zero
- (iv) A rise in the price of coffee leads to a rise in the demand for tea. What is the relation between the two goods called?
- (v) A good whose demand falls when the income of the consumer rises is called:
  - (a) a normal good
  - (b) a substitute good
  - (c) a complementary good
  - (d) an inferior good
- (vi) State the reason why the average fixed cost curve never touches the output axis, however large the output becomes.
- (vii) In a market in which a single seller faces many buyers and the product has no close substitute, the firm's average revenue curve:
  - (a) is a horizontal straight line
  - (b) slopes downwards throughout
  - (c) slopes upwards throughout
  - (d) is vertical
- (viii) What happens to the equilibrium price of a commodity if demand rises while supply stays where it is?

Answer all of Questions 2 to 5. Each carries 3 marks.

#### Question 2 [3]

An economy produces only wheat and cloth with a fixed quantity of resources and a given technology. Explain, with reference to a production possibility curve you are to draw and label, why the curve is concave to the origin. State also what would happen to the whole curve if a new technique raised the

output of wheat alone. [3]

### Question 3 [3]

When the price of a commodity falls from Rs 20 to Rs 16 per unit, the quantity demanded of it rises from 400 units to 550 units. Calculate the price elasticity of demand by the percentage method, state whether demand is elastic or inelastic at this price, and state what happens to the total expenditure of the buyers as a result of the fall in price. [3]

### Question 4 [3]

A consumer spends her whole income on two commodities, X and Y. State the condition that must hold if she is in equilibrium under the cardinal utility approach, and explain how she would adjust her purchases if the marginal utility of a rupee spent on X were greater than the marginal utility of a rupee spent on Y. [3]

### Question 5 [3]

Distinguish between a movement along a supply curve and a shift of the whole supply curve, giving one cause of each. Draw a single labelled diagram that shows both. [3]

*Answer any two of Questions 6, 7 and 8. Each carries 10 marks.*

### Question 6 [10]

A firm has a total fixed cost of Rs 60. Its total variable cost at outputs of 1, 2, 3, 4 and 5 units is Rs 30, Rs 50, Rs 66, Rs 90 and Rs 130 respectively.

- Work out, for each level of output, the total cost, the average fixed cost, the average variable cost, the average cost and the marginal cost. Set your figures out as a schedule with one line for each level of output. [6]
- State the output at which average variable cost is lowest and the output at which average cost is lowest, and explain, with reference to your figures, why the second comes after the first. [2]
- Draw a single labelled diagram showing the average cost curve, the average variable cost curve and the marginal cost curve of a firm, and state the relation that holds between the marginal cost curve and each of the other two. [2]

### Question 7 [10]

- Define an indifference curve. State three properties of an indifference curve and give the reason for each. [5]
- A consumer has an income of Rs 120. The price of X is Rs 10 per unit and the price of Y is Rs 20 per unit. Write the equation of her budget line, state the quantity of each good she could buy if she spent the whole of her income on that good alone, and state the slope of the budget line. Draw and label the line. [3]
- State the condition for consumer equilibrium under the ordinal utility approach and explain why a point at which the marginal rate of substitution exceeds the ratio of the prices cannot be a point of equilibrium. [2]

### Question 8 [10]

A firm selling in an imperfectly competitive market finds that its total revenue at outputs of 1, 2, 3, 4 and 5 units is Rs 18, Rs 32, Rs 42, Rs 48 and Rs 50 respectively. Its total fixed cost is Rs 5, and its marginal cost at those same five levels of output is Rs 14, Rs 10, Rs 8, Rs 12 and Rs 16 respectively.

- Work out the average revenue and the marginal revenue at each level of output, and state what the figures tell you about the shape of the firm's average revenue curve. [4]
- Work out the total cost and the profit at each level of output, and hence state the output the firm will settle at and the profit it will earn there. Justify your answer by the marginal revenue and marginal cost

condition. [4]

- (c) State two features of a perfectly competitive market that are absent from the market in which this firm is selling. [2]

## SECTION B: MACROECONOMICS AND INDIAN ECONOMIC DEVELOPMENT (40 Marks)

### Question 9 [8]

Each part carries 1 mark. For the parts that offer four choices, write only the option you choose. For the rest, answer in a single sentence or give the single word, term or value asked for.

- (i) The value of the final goods and services produced within the domestic territory of a country in a year, before any allowance is made for the wearing out of capital, is:  
 (a) net domestic product (b) net national product  
 (c) gross domestic product (d) personal income
- (ii) Define the marginal propensity to consume.
- (iii) If the legal reserve ratio is raised by the central bank, the credit creating power of the commercial banks:  
 (a) falls (b) rises  
 (c) stays where it was (d) becomes unlimited
- (iv) Name the item that makes the difference between the fiscal deficit and the primary deficit of a government.
- (v) An entry in the balance of payments that is made with the object of covering a gap in the rest of the account is called:  
 (a) an autonomous item (b) a current account item  
 (c) an invisible item (d) an accommodating item
- (vi) State one reason why expenditure on the education of a country's people is treated as an investment and not merely as a consumption.
- (vii) A person who works through the year but whose work yields him so little that he cannot meet his basic needs is best described as:  
 (a) openly unemployed (b) working poor  
 (c) seasonally unemployed (d) frictionally unemployed
- (viii) State one reason why the ground water of the northern plains of India has come under strain since the spread of tube well irrigation.

Answer all of Questions 10 to 13. Each carries 3 marks.

### Question 10 [3]

Explain what is meant by the problem of double counting in the measurement of national income, give one example of it, and state the two ways in which it may be avoided. [3]

### Question 11 [3]

In an economy the marginal propensity to save is 0.25. Calculate the value of the investment multiplier and the increase in national income that would follow an increase in investment of Rs 200 crore. State also the value of the marginal propensity to consume in this economy. [3]

### Question 12 [3]

A commercial banking system receives a fresh deposit of Rs 5,000 crore when the legal reserve ratio is 20 per cent. Calculate the money multiplier, the total deposits the system can finally create and the amount of credit created, and state one reason why the full amount may not be reached in practice. [3]

### Question 13 [3]

Distinguish between the current account and the capital account of the balance of payments, giving two items that fall under each. [3]

Answer any two of Questions 14, 15 and 16. Each carries 10 marks.

**Question 14 [10]**

The following figures, all in crores of rupees, relate to an economy for a year. Private final consumption expenditure 1,800; government final consumption expenditure 500; gross domestic fixed capital formation 400; change in stocks 50; exports 120; imports 150; consumption of fixed capital 70; net factor income from abroad 20; net indirect taxes 110.

- (a) Calculate the gross domestic product at market price, the net domestic product at market price, the net national product at market price and the national income. [6]
- (b) Explain the difference between a domestic aggregate and a national aggregate, and state which of the figures given above is the bridge between the two. [2]
- (c) Explain why the change in stocks is included in the expenditure method while the purchase of a second hand lorry by a firm is not. [2]

**Question 15 [10]**

The following figures, all in crores of rupees, are taken from the budget of a government for a year. Revenue receipts 1,200; revenue expenditure 1,500; capital receipts 800, of which borrowings account for 600; capital expenditure 500; interest payments 200.

- (a) Calculate the revenue deficit, the fiscal deficit and the primary deficit of this government, showing your working in each case. [6]
- (b) State two objectives a government pursues through its budget, explaining each in a line or two. [2]
- (c) Explain why a high fiscal deficit is regarded as a matter for concern even where the money borrowed is spent on building roads and bridges. [2]

**Question 16 [10]**

The marks obtained by seven students in a test were 10, 12, 15, 15, 18, 20 and 22.

- (a) Calculate the arithmetic mean, the median and the mode of these marks, and state which of the three is affected most by an extremely high value in the data. [4]

The table that follows gives the number of hours spent on revision each week, X, and the marks scored, Y, by five students. X takes the values 1, 2, 3, 4 and 5, and the matching values of Y are 6, 10, 8, 12 and 14.

- (b) Calculate the Karl Pearson coefficient of correlation between X and Y, setting out your working, and interpret the value you obtain. [6]

## ANSWER KEY AND MARKING SCHEME

Full working is shown for every numerical, and every schedule is carried through so that each figure in it can be checked. Marks shown in italics are the step marks an examiner would award. Accept any correct alternative method that reaches the same figure, accept a correctly drawn and labelled curve in any reasonable style, and accept a numerical answer rounded to one or to two decimal places.

### Question 1 [8]

- (i) (c) leaving some of its resources idle or using them inefficiently. Every point inside the curve is attainable but wasteful, since the economy could move out to the curve itself and have more of one good without giving up any of the other.
- (ii) Opportunity cost is the value of the next best alternative that has to be given up in order to take up the course actually chosen. If a plot of land is used to grow wheat, the opportunity cost is the quantity of the next best crop the same plot could have carried.
- (iii) (a) total utility is at its highest. Marginal utility is the addition that each further unit makes to total utility, so once that addition has shrunk to nothing, total utility can rise no further and stands at its peak, which is the point of satiety.
- (iv) They are substitute goods. The demand for one and the price of the other move in the same direction, so the cross elasticity of demand between them is positive.
- (v) (d) an inferior good. For such a good the income effect is negative, so the consumer buys less of it as she grows better off and turns instead to a superior substitute.
- (vi) Average fixed cost is total fixed cost divided by output. Total fixed cost is a positive amount that does not alter with output, so however large the output grows the quotient grows ever smaller without ever reaching zero. The curve is a rectangular hyperbola and comes nearer and nearer to the output axis without touching it.
- (vii) (b) slopes downwards throughout. A single seller with no close substitute for his product must lower his price if he wishes to sell more, so average revenue falls as output rises, and the curve, which is the demand curve for his product, slopes down from left to right.
- (viii) The equilibrium price rises, and the equilibrium quantity rises with it. The rightward shift of the demand curve creates excess demand at the old price, buyers bid the price up, and a new equilibrium is reached further up the unchanged supply curve.

*1 mark for each of the eight parts. No mark is deducted for a wrong option, and a one-line answer that carries the correct point gains the mark even if it is loosely worded.*

### Question 2 [3]

The curve is to be drawn with wheat on one axis and cloth on the other, as a curve running from a point on one axis to a point on the other and bowing outwards away from the origin. It is concave to the origin because the marginal rate of transformation rises as more and more of one good is produced. Resources are not equally suited to both uses. When the economy begins to shift resources out of cloth and into wheat it moves first the resources best suited to wheat and least suited to cloth, so little cloth is lost for each extra unit of wheat. As the shift goes on, resources that were well suited to cloth have to be moved, and the sacrifice of cloth for each further unit of wheat grows larger. That rising sacrifice is the rising opportunity cost, and a curve whose slope grows steeper as we move along it in this way must be concave to the origin. A new technique that raised the output of wheat alone would not shift the whole curve outwards. The intercept on the wheat axis would move outwards while the intercept on the cloth axis stayed where it was, so the curve would pivot about the cloth intercept and only the wheat end of it would move.

*Curve correctly drawn and labelled, bowing outwards from the origin 1. Concavity explained by the rising marginal rate of transformation, resources not being equally suited to both uses 1. Pivot about the cloth intercept, with only the wheat intercept moving out 1.*

### Question 3 [3]

Percentage change in quantity demanded =  $(550 - 400)/400 \times 100 = 37.5$  per cent. Percentage change in price =  $(16 - 20)/20 \times 100 = \text{minus } 20$  per cent. Price elasticity of demand =  $37.5$  divided by  $\text{minus } 20 = \text{minus}$

1.875, which is read as a numerical value of 1.875. Since the numerical value is greater than one, demand is elastic at this price. Total expenditure therefore rises when the price falls, because the proportionate rise in quantity is larger than the proportionate fall in price. The figures bear this out. Expenditure before the fall was  $400 \times 20 = \text{Rs } 8,000$ , and after it  $550 \times 16 = \text{Rs } 8,800$ , a rise of Rs 800.

*Percentage changes of 37.5 per cent and minus 20 per cent 1. Elasticity 1.875 in numerical value 1. Demand identified as elastic and total expenditure shown to rise from Rs 8,000 to Rs 8,800 1.*

#### Question 4 [3]

Under the cardinal utility approach the consumer is in equilibrium when the marginal utility of the last rupee spent is the same in both uses and the whole income is spent, that is when  $MU_x/P_x = MU_y/P_y$ , with the law of diminishing marginal utility holding so that each ratio falls as more of the good is bought. If the marginal utility of a rupee spent on X were greater than that of a rupee spent on Y, the consumer would not be in equilibrium, because she could add to her total satisfaction by moving a rupee out of Y and into X. As she buys more X its marginal utility falls, and as she buys less Y the marginal utility of Y rises. The two ratios therefore move towards one another, and she goes on transferring expenditure until they are equal, at which point no further transfer can add anything and she is in equilibrium.

*Equilibrium condition  $MU_x/P_x = MU_y/P_y$  with the whole income spent 1. Transfer of expenditure from Y to X 1. The two ratios brought to equality by diminishing marginal utility, ending the transfer 1.*

#### Question 5 [3]

A movement along a supply curve is a change in the quantity supplied brought about by a change in the price of the good itself, every other determinant being unchanged. A rise in price takes the producer up the same curve and is called an extension of supply, while a fall takes him down it and is called a contraction. A shift of the whole supply curve is a change in supply brought about by a change in some determinant other than the price of the good, the price itself being unchanged. A fall in the price of an input, or an improvement in technique, shifts the curve to the right, while a rise in the price of an input or a heavier indirect tax shifts it to the left. The diagram is to be drawn with price on the vertical axis and quantity on the horizontal. Show one supply curve SS sloping upwards, mark two points on it at two different prices and join each to its axes with dotted lines to bring out the movement along the curve. Then draw a second curve  $S_1S_1$  to the right of the first and mark the quantity supplied on it at the original price, which brings out the shift.

*Movement along the curve defined, with a change in the good's own price as its cause 1. Shift defined, with a cause other than price 1. Single diagram correctly drawn and labelled, showing both 1.*

#### Question 6 [10]

(a) The schedule works out as follows, all figures in rupees. Total fixed cost is Rs 60 at every level of output.

Total cost = total fixed cost + total variable cost. Average fixed cost = total fixed cost divided by output, average variable cost = total variable cost divided by output, average cost = total cost divided by output, and marginal cost is the addition that the unit in question makes to total cost.

Output 1: TVC 30, TC 90, AFC 60.00, AVC 30.00, AC 90.00, MC 30.

Output 2: TVC 50, TC 110, AFC 30.00, AVC 25.00, AC 55.00, MC 20.

Output 3: TVC 66, TC 126, AFC 20.00, AVC 22.00, AC 42.00, MC 16.

Output 4: TVC 90, TC 150, AFC 15.00, AVC 22.50, AC 37.50, MC 24.

Output 5: TVC 130, TC 190, AFC 12.00, AVC 26.00, AC 38.00, MC 40.

The marginal cost figures can be checked by adding them to the fixed cost:  $60 + 30 + 20 + 16 + 24 + 40 = \text{Rs } 190$ , which is the total cost at the fifth unit.

*Total cost of Rs 90, 110, 126, 150 and 190 1. Average fixed cost of Rs 60.00, 30.00, 20.00, 15.00 and 12.00 1. Average variable cost of Rs 30.00, 25.00, 22.00, 22.50 and 26.00 2. Average cost of Rs 90.00, 55.00, 42.00, 37.50 and 38.00 1. Marginal cost of Rs 30, 20, 16, 24 and 40 1.*

(b) Average variable cost is lowest at the third unit, where it is Rs 22.00. Average cost is lowest at the fourth unit, where it is Rs 37.50. The minimum of average cost comes at the higher output because average cost is the

sum of average variable cost and average fixed cost. Past the third unit average variable cost begins to rise, going from Rs 22.00 to Rs 22.50, a rise of only 50 paise, while average fixed cost is still falling steeply, from Rs 20.00 to Rs 15.00, a fall of Rs 5.00. The fall in the fixed element therefore more than offsets the rise in the variable element and average cost keeps coming down for one more unit. Only at the fifth unit does the rise in average variable cost, Rs 3.50, outweigh the further fall in average fixed cost, Rs 3.00, and average cost turns upwards.

*Average variable cost lowest at the third unit and average cost lowest at the fourth 1. The later minimum traced to average fixed cost still falling faster than average variable cost is rising, with the figures quoted 1.*

- (c) The diagram is to be drawn with cost on the vertical axis and output on the horizontal. Draw the average variable cost curve as a U shape, the average cost curve as a U shape lying above it throughout and coming closer to it as output grows, and the marginal cost curve as a steeper U cutting each of the other two. The relations are these. Marginal cost cuts average variable cost at the lowest point of average variable cost, and it cuts average cost at the lowest point of average cost, which lies to the right of the first. Where marginal cost is below an average curve that average curve is falling, where marginal cost is above it that average curve is rising, and where the two are equal the average curve is at its minimum. The gap between average cost and average variable cost is average fixed cost, which narrows as output rises, so the two curves draw together without ever meeting.

*All three curves drawn and labelled, with average cost above average variable cost and the gap narrowing 1. Marginal cost cutting each average curve at its minimum, the average cost minimum lying to the right 1.*

### Question 7 [10]

- (a) An indifference curve is a curve joining all those combinations of two goods which give the consumer the same level of satisfaction, so that the consumer is indifferent between every point on it and has no reason to prefer one to another. Three properties follow. First, an indifference curve slopes downwards from left to right. If the consumer is to stay at the same level of satisfaction and takes more of one good, she must give up some of the other, for if she had more of one and no less of the other she would be better off and not indifferent. Second, an indifference curve is convex to the origin. Its slope is the marginal rate of substitution, the amount of one good the consumer will give up for one more unit of the other, and that rate falls as she moves down the curve, because the more she has of a good the less she values a further unit of it and the more she values the good she is now short of. A falling marginal rate of substitution gives a curve convex to the origin. Third, two indifference curves can never cut one another. If they did, the point of intersection would lie on both curves, so it would carry the same satisfaction as a point on the lower curve and also the same satisfaction as a point on the higher curve, which would make those two points equal in satisfaction when by the definition of a higher curve they are not. A fourth property that may be offered in place of any of these is that a higher indifference curve carries a higher level of satisfaction, since a point on it holds more of at least one good and no less of the other.

*Indifference curve correctly defined 2. Downward slope with its reason 1. Convexity with the falling marginal rate of substitution as its reason 1. Curves never cutting, with the contradiction set out 1.*

- (b) The budget line is  $10X + 20Y = 120$ . If the whole income were spent on X alone the consumer could buy 120 divided by 10 = 12 units of X, and if it were spent on Y alone she could buy 120 divided by 20 = 6 units of Y. The slope of the budget line, taken in numerical value, is the ratio of the prices,  $P_x/P_y = 10/20 = 0.5$ , which is the same as the ratio of the two intercepts, 6 divided by 12. The line is to be drawn with X on the horizontal axis and Y on the vertical, as a straight line joining the point 12 on the X axis to the point 6 on the Y axis, and labelled as the budget line or price line.

*Equation  $10X + 20Y = 120$  1. Intercepts of 12 units of X and 6 units of Y 1. Slope 0.5 and the line correctly drawn and labelled 1.*

- (c) Under the ordinal utility approach the consumer is in equilibrium where the budget line is tangent to an indifference curve, that is where the marginal rate of substitution equals the ratio of the prices,  $MRS = P_x/P_y$ , and where the indifference curve is convex to the origin at that point. If the marginal rate of substitution exceeded the price ratio, the consumer would be willing to give up more of Y for an extra unit of X than the market in fact requires her to give up. She could therefore buy one more unit of X, surrender the smaller

amount of Y the market asks for and finish on a higher indifference curve. Since a move is available that makes her better off, she cannot already have been in equilibrium, and she will go on buying X until the fall in the marginal rate of substitution brings it down to the price ratio.

*Tangency condition  $MRS = P_x/P_y$ , with convexity 1. Explanation that a higher indifference curve is still reachable, so the point is not an equilibrium 1.*

### Question 8 [10]

- (a) Average revenue is total revenue divided by output and marginal revenue is the addition that the unit in question makes to total revenue. Output 1: TR 18, AR 18, MR 18. Output 2: TR 32, AR 16, MR 14. Output 3: TR 42, AR 14, MR 10. Output 4: TR 48, AR 12, MR 6. Output 5: TR 50, AR 10, MR 2. The marginal revenue figures add back to total revenue:  $18 + 14 + 10 + 6 + 2 = \text{Rs } 50$ . Average revenue falls by exactly Rs 2 for every extra unit sold, so the average revenue curve is a downward sloping straight line, which tells us the firm faces a downward sloping demand curve and must cut its price to sell more. Marginal revenue falls by Rs 4 a unit, twice as fast as average revenue, which is the usual relation for a straight line average revenue curve.

*Average revenue of Rs 18, 16, 14, 12 and 10 2. Marginal revenue of Rs 18, 14, 10, 6 and 2 1. Average revenue curve identified as a downward sloping straight line, with marginal revenue falling twice as fast 1.*

- (b) Total cost is the total fixed cost of Rs 5 plus the marginal costs accumulated up to that output. Output 1: TC  $5 + 14 = 19$ , TR 18, profit minus 1. Output 2: TC  $19 + 10 = 29$ , TR 32, profit 3. Output 3: TC  $29 + 8 = 37$ , TR 42, profit 5. Output 4: TC  $37 + 12 = 49$ , TR 48, profit minus 1. Output 5: TC  $49 + 16 = 65$ , TR 50, profit minus 15. The firm will settle at an output of 3 units and will earn a profit of Rs 5, which is the largest figure in the column. The marginal condition confirms it. At the third unit marginal revenue is Rs 10 against a marginal cost of Rs 8, so that unit adds Rs 2 to profit and is worth making. At the fourth unit marginal revenue is Rs 6 against a marginal cost of Rs 12, so that unit would take Rs 6 off profit and is not worth making. The third unit is therefore the last one for which marginal revenue is not less than marginal cost, and marginal cost is rising past that point, so the second condition for equilibrium is met as well.

*Total cost of Rs 19, 29, 37, 49 and 65 2. Profit of minus 1, 3, 5, minus 1 and minus 15 1. Equilibrium output 3 units with a profit of Rs 5, justified by marginal revenue exceeding marginal cost at the third unit and falling short of it at the fourth 1.*

- (c) Any two of the following gain the marks. In perfect competition the product of every firm is homogeneous, so no firm can charge more than another, whereas this firm's product must be differentiated, since it can raise its price and still sell something. In perfect competition each firm is so small a part of the market that it is a price taker and faces a horizontal average revenue curve at which marginal revenue equals average revenue, whereas here average revenue falls as output rises and marginal revenue lies below it. In perfect competition there is perfect knowledge among buyers and sellers, and in perfect competition there is free entry and free exit, so that no firm can hold on to a profit above the normal in the long run. In perfect competition no firm incurs selling costs, since there is nothing to advertise about a homogeneous product.

*One feature of perfect competition stated and shown to be absent here 1. A second, different feature stated and shown to be absent here 1.*

### Question 9 [8]

- (i) (c) gross domestic product. The word domestic fixes the boundary as the territory rather than the residents, and the word gross means that the consumption of fixed capital has not yet been deducted.
- (ii) The marginal propensity to consume is the proportion of an addition to income that is spent on consumption, that is the ratio of the change in consumption expenditure to the change in income that brought it about. Its value lies between zero and one, and together with the marginal propensity to save it adds up to one.
- (iii) (a) falls. A higher legal reserve ratio obliges the banks to keep back a larger part of every deposit, so less is left to lend. The money multiplier is the reciprocal of the ratio, and raising the ratio therefore lowers the multiplier and with it the total deposits that can be created on a given base.
- (iv) Interest payments. The primary deficit is the fiscal deficit less the interest payments of the government, so the two differ by exactly that item, and the primary deficit shows how much of the current year's borrowing is needed for reasons other than servicing the debt already built up.

- (v) (d) an accommodating item. Such items are undertaken by the monetary authority to settle whatever imbalance the autonomous items have left, which is why the balance of payments always balances in the accounting sense even when there is a deficit in the autonomous account.
- (vi) Expenditure on education raises the knowledge, the skill and the productive capacity of the people on whom it is spent, and that higher capacity yields a stream of higher earnings and higher output over the whole of their working lives. The spending therefore creates an asset in the form of human capital, and like any other investment it gives up something in the present for a return spread over the future.
- (vii) (b) working poor. He is not without work, so he is not openly unemployed, but the earnings his work yields are too small to lift him above the poverty line, which is why unemployment figures alone give an incomplete picture of the Indian labour market.
- (viii) Tube wells allow water to be drawn far faster than the aquifer is recharged by rainfall and seepage, and the wheat and paddy rotation that the green revolution brought in is heavy in its water use. Where electricity for pumping is free or nearly so there is nothing to restrain the drawing, so the water table has fallen year after year and in many blocks the ground water is now overexploited.

*1 mark for each of the eight parts. No mark is deducted for a wrong option, and a one-line answer that carries the correct point gains the mark even if it is loosely worded.*

### Question 10 [3]

Double counting is the error of including the value of the same output more than once in the measure of national income. It arises because the output of one producer is often the input of another, so that if the whole of each producer's sales were added up, the part of it that merely passes along the chain would be counted at every stage. Suppose a farmer sells wheat to a miller for Rs 500, the miller sells flour to a baker for Rs 700, and the baker sells bread to households for Rs 1,000. If all three figures were added, the total would be Rs 2,200, whereas the value actually created in the economy is only Rs 1,000, the price of the final good. There are two ways of avoiding the error. The first is the final output method, under which only the value of final goods and services, those which leave the production process and are not used up again as intermediate inputs, is counted, giving Rs 1,000. The second is the value added method, under which the value of the intermediate inputs is deducted from the value of each producer's output and only the addition each makes is counted, giving 500 plus 200 plus 300, which is again Rs 1,000.

*Double counting explained as counting the same output more than once because one producer's output is another's input 1. A correct example worked through 1. Both the final output method and the value added method named as the remedies 1.*

### Question 11 [3]

The investment multiplier  $k = 1/\text{MPS} = 1/0.25 = 4$ . The increase in national income  $= k \times \text{the increase in investment} = 4 \times 200 = \text{Rs } 800 \text{ crore}$ . The marginal propensity to consume  $= 1 - \text{MPS} = 1 - 0.25 = 0.75$ . The multiplier works because the Rs 200 crore spent on investment becomes income in the hands of those who receive it, three quarters of which they spend, which becomes income for others, and so on through successive rounds, each smaller than the one before. The rounds sum to four times the original injection.

*Multiplier 4 1. Increase in national income Rs 800 crore 1. Marginal propensity to consume 0.75 1.*

### Question 12 [3]

The money multiplier  $= 1/\text{LRR} = 1/0.20 = 5$ . Total deposits finally created  $= \text{the fresh deposit} \times \text{the money multiplier} = 5,000 \times 5 = \text{Rs } 25,000 \text{ crore}$ . Credit created  $= \text{total deposits less the original deposit} = 25,000 - 5,000 = \text{Rs } 20,000 \text{ crore}$ . The full amount may not be reached in practice for any of the following reasons, one of which is wanted. Part of the money lent out is held by the public as cash instead of coming back to the banks as a deposit, so the chain leaks at every round. Banks may keep reserves above the legal minimum because they judge the risk too high or because they cannot find enough creditworthy borrowers. Demand for loans may itself be weak, and no bank can force a loan on an unwilling borrower.

*Money multiplier 5 1. Total deposits Rs 25,000 crore and credit created Rs 20,000 crore 1. One sound reason why the full amount may not be reached 1.*

### Question 13 [3]

The current account of the balance of payments records those transactions which affect the current income of the country and bring about no change in its assets or its liabilities. It covers the export and import of goods, which are the visible items, and the export and import of services, together with investment income and current transfers, which are the invisible items. Two items under it are the export of software services and the remittances sent home by Indians working abroad. The capital account records those transactions which do alter the assets or the liabilities of the country vis-a-vis the rest of the world, so that every entry in it changes the national stock of foreign assets or foreign debt. Two items under it are foreign direct investment coming into the country and the borrowing of a commercial loan from abroad. The distinction matters because a current account deficit must be financed by a capital account inflow or by drawing down the foreign exchange reserves, and a country that goes on borrowing to pay for current consumption builds up a claim against its own future income.

*Current account defined as recording transactions that do not alter assets or liabilities, with two correct items 1. Capital account defined as recording transactions that do alter them, with two correct items 1. The relation between the two brought out, or the visible and invisible division of the current account set out 1.*

### Question 14 [10]

- (a) Net exports = exports – imports = 120 – 150 = minus Rs 30 crore. Gross domestic product at market price = private final consumption expenditure + government final consumption expenditure + gross domestic fixed capital formation + change in stocks + net exports = 1,800 + 500 + 400 + 50 + (minus 30) = Rs 2,720 crore. Net domestic product at market price = GDP at market price – consumption of fixed capital = 2,720 – 70 = Rs 2,650 crore. Net national product at market price = NDP at market price + net factor income from abroad = 2,650 + 20 = Rs 2,670 crore. National income, which is net national product at factor cost, = NNP at market price – net indirect taxes = 2,670 – 110 = Rs 2,560 crore.

*Net exports minus Rs 30 crore 1. Gross domestic product at market price Rs 2,720 crore 2. Net domestic product at market price Rs 2,650 crore 1. Net national product at market price Rs 2,670 crore 1. National income Rs 2,560 crore 1.*

- (b) A domestic aggregate measures what is produced within the economic territory of the country, no matter whether the factors of production that earned the income are residents of that country or not. A national aggregate measures what is earned by the normal residents of the country, no matter whether they earned it inside the territory or outside it. The bridge between the two is net factor income from abroad, which is Rs 20 crore in these figures. It is the factor income earned by residents abroad less the factor income earned within the territory by non-residents, and adding it to a domestic aggregate converts that aggregate into the matching national one.

*Distinction drawn correctly between territory and residence 1. Net factor income from abroad named as the bridge, with its value of Rs 20 crore 1.*

- (c) The change in stocks is a part of investment. Goods produced during the year but not sold during it are output of this year all the same, and if they were left out the expenditure total would fall short of the output the economy actually produced. Counting them as an addition to the producer's own stock of capital, that is as inventory investment, brings the expenditure total back into line with production. A second hand lorry is different. It was produced in some earlier year and was counted in the national income of that year. Its purchase now is only a transfer of an existing asset from one owner to another and adds nothing to this year's output, so it is excluded. What is included is any commission paid to a dealer for arranging the sale, since that is a service produced this year.

*Change in stocks included as inventory investment, being output of the year that has not been sold 1. Second hand lorry excluded as a transfer of an existing asset already counted in an earlier year, with the dealer's commission the exception 1.*

### Question 15 [10]

- (a) Revenue deficit = revenue expenditure – revenue receipts = 1,500 – 1,200 = Rs 300 crore. For the fiscal deficit the capital receipts must first be split, since borrowings are themselves a part of the deficit and cannot be treated as a receipt that finances it. Non-debt capital receipts = capital receipts – borrowings = 800 – 600 = Rs 200 crore. Total expenditure = revenue expenditure + capital expenditure = 1,500 + 500 = Rs 2,000 crore.

Total receipts other than borrowings = revenue receipts + non-debt capital receipts = 1,200 + 200 = Rs 1,400 crore. Fiscal deficit = 2,000 – 1,400 = Rs 600 crore, which agrees with the borrowings figure given, as it must, since the fiscal deficit is by definition the amount the government has to borrow. Primary deficit = fiscal deficit – interest payments = 600 – 200 = Rs 400 crore.

*Revenue deficit Rs 300 crore 2. Non-debt capital receipts Rs 200 crore, with borrowings correctly excluded 1. Total expenditure Rs 2,000 crore 1. Fiscal deficit Rs 600 crore, agreeing with the borrowings 1. Primary deficit Rs 400 crore 1.*

- (b) Any two of the following gain the marks. Reallocation of resources, under which the budget steers production towards goods the market would under-provide and away from goods whose private profitability overstates their social worth, by taxing the one and subsidising or directly producing the other. Redistribution of income, under which progressive taxation takes more from the better off while transfers, subsidies and spending on health and schooling raise the real income of the poor, so that the gap between the two narrows. Economic stability, under which the government cuts its spending or raises taxes when prices are running away and does the reverse when output and employment are slack. Management of public enterprise, and the provision of public goods such as defence and the courts, for which no price can be charged to individual users.

*One objective of the budget named and explained 1. A second, different objective named and explained 1.*

- (c) Borrowing to build roads and bridges is sounder than borrowing to meet current consumption, since the asset created will raise output in later years and so help to repay the loan. Even so a high fiscal deficit remains a concern. Every year's deficit adds to the stock of public debt, and the interest on it becomes a first charge on the revenue of every later year, so that a growing share of what the government collects goes to servicing past borrowing instead of to fresh spending. Heavy government borrowing also absorbs the savings of the economy and tends to push interest rates up, which crowds private investment out of the market. Where the borrowing is met by creating money it feeds inflation. And a debt built up today has to be serviced by taxpayers who had no part in the decision, which shifts the burden onto a later generation.

*The case for capital spending acknowledged 1. At least two of the concerns, the growing interest burden, the crowding out of private investment, inflation or the burden on a later generation, properly explained 1.*

### Question 16 [10]

- (a) The marks are 10, 12, 15, 15, 18, 20, 22, and there are seven of them. Arithmetic mean =  $(10 + 12 + 15 + 15 + 18 + 20 + 22)/7 = 112/7 = 16$  marks. The values are already in order, and with seven items the median is the fourth, so the median = 15 marks. The mode is the value that occurs most often, and 15 occurs twice while every other value occurs once, so the mode = 15 marks. Of the three it is the arithmetic mean that is affected most by an extremely high value, because every item enters the calculation at its full size and so pulls the total and with it the average. The median depends only on the position of the middle item and the mode only on the value that recurs, so neither moves when one item at the end of the distribution is replaced by a much larger one.

*Arithmetic mean 16 marks 2. Median 15 marks 1. Mode 15 marks, and the mean named as the measure most affected by an extreme value, with the reason 1.*

- (b) Take the deviations from the arithmetic means. Mean of X =  $(1 + 2 + 3 + 4 + 5)/5 = 15/5 = 3$ . Mean of Y =  $(6 + 10 + 8 + 12 + 14)/5 = 50/5 = 10$ . The deviations of X from its mean, written dx, are minus 2, minus 1, 0, 1 and 2. The deviations of Y from its mean, written dy, are minus 4, 0, minus 2, 2 and 4. The products dx times dy are 8, 0, 0, 2 and 8, so the sum of dx dy = 18. The squares of dx are 4, 1, 0, 1 and 4, so the sum of  $dx^2 = 10$ . The squares of dy are 16, 0, 4, 4 and 16, so the sum of  $dy^2 = 40$ . By Karl Pearson's formula  $r = \text{sum of } dx dy \text{ divided by the square root of } (\text{sum of } dx^2 \times \text{sum of } dy^2) = 18 \text{ divided by the square root of } (10 \times 40) = 18 \text{ divided by the square root of } 400 = 18/20 = 0.9$ . The value is positive, so the two variables move in the same direction, and at 0.9 it is close to the upper limit of plus one, so the correlation is high and positive. Hours of revision and marks scored go up and down together very closely in this group of five students, though a coefficient of correlation on its own establishes association and not cause.

*Means of X and Y as 3 and 10 1. Deviations dx and dy correctly worked out 1. Sum of dx dy = 18 1. Sum of  $dx^2 = 10$  and sum of  $dy^2 = 40$  1. Coefficient  $r = 0.9$  1. Interpretation as a high positive correlation, with the caution about causation 1.*