34

QUESTION PAPER SERIES CODE
A

Registration No. : | | | | | |

Centre of Exam. : _____

Name of Candidate : _____

_____
Signature of Invigilator

ENTRANCE EXAMINATION, 2015

M.Phil./Ph.D. ECONOMIC STUDIES AND PLANNING

[Field of Study Code : ECOP (136)]

Time Allowed : 3 hours

Maximum Marks : 70

INSTRUCTIONS FOR CANDIDATES

Candidates must read carefully the following instructions before attempting the Question Paper :

(i) Write your Name and Registration Number in the space provided for the purpose on the top of this Question Paper and in the Answer Sheet.

(ii) **Please darken the appropriate Circle of Question Paper Series Code on the Answer Sheet.**

(iii) **All** questions are compulsory.

(iv) **The question paper has two Parts : A and B. Part—A has 30 questions of 1 mark each. Part—B has 20 questions of 2 marks each.**

(v) Answer all the 50 questions in the Answer Sheet provided for the purpose by darkening the correct choice, i.e., (a) or (b) or (c) or (d) with BALLPOINT PEN only against the corresponding circle. Any overwriting or alteration will be treated as a wrong answer.

(vi) **There will be negative marking. For each wrong answer, ¼ mark would be deducted for 1 mark questions and ½ mark would be deducted for 2 mark questions.**

(vii) Answers written by the candidates inside the Question Paper will not be evaluated.

(viii) Pages at the end have been provided for Rough Work.

(ix) Return the Question Paper and Answer Sheet to the Invigilator at the end of the Entrance Examination. **DO NOT FOLD THE ANSWER SHEET.**

INSTRUCTIONS FOR MARKING ANSWERS

1. Use only Blue/Black Ballpoint Pen (do not use pencil) to darken the appropriate Circle.
2. Please darken the whole Circle.
3. Darken ONLY ONE CIRCLE for each question as shown in example below :

Wrong	Wrong	Wrong	Wrong	Correct
● ⓑ ⓒ ●	⊘ ⓑ ⓒ ⓓ	⊘ ⓑ ⓒ ⊘	◉ ⓑ ⓒ ●	ⓐ ⓑ ⓒ ●

4. Once marked, no change in the answer is allowed.
5. Please do not make any stray marks on the Answer Sheet.
6. Do rough work only on the pages provided for this purpose.
7. Mark your answer only in the appropriate space against the number corresponding to the question.
8. **Ensure that you have darkened the appropriate Circle of Question Paper Series Code on the Answer Sheet.**

PART—A

Each question carries *1* mark

1. In a given group, the correlation between height, measured in feet, and weight, measured in pounds, is +0·68. Which of the following would alter the value of *r*?

   (a) If height is expressed in centimetres

   (b) If weight is expressed in kilograms

   (c) Both of the above will affect *r*

   (d) Neither of the above changes will affect *r*

2. The correlation between scores on a neuroticism test and scores on an anxiety test is high and positive; therefore

   (a) anxiety causes neuroticism

   (b) those who score low on one test tend to score high on the other

   (c) those who score low on one test tend to score low on the other

   (d) no prediction from one test to the other can be meaningfully made

3. Variables in which measurement is always approximate because they permit an unlimited number of intermediate values are

   (a) nominal

   (b) discrete

   (c) ordinal

   (d) continuous

4. To check for stationarity of an autoregressive model, we can use

(a) Breusch-Pagan test

(b) Dickey-Fuller test

(c) Hausman test

(d) None of the above

5. Identify the true statement.
Note that $|x|$ stands for the absolute value of x. For any two real numbers a and b

(a) $|a-b|<|a|-|b|$

(b) $|a-b|\geq|a|-|b|$

(c) $|a-b|$ is sometimes strictly lower than $|a|-|b|$

(d) $|a-b|$ is never equal to $|a|-|b|$

6. Let $|x|$ stand for the absolute value of x. Then the function $f(x)=|x|$ is

(a) differentiable everywhere including the point 0

(b) differentiable everywhere excluding the point 0

(c) differentiable everywhere excluding the points 0, 1 and -1

(d) None of the above

7. Let $A=\{1\}$ and $B=\{1, 2\}$. Then we have

(a) $A\in B$

(b) $1\in A$

(c) $1\subseteq A$

(d) $1\subset B$

8. Let $P(n, m)$ be a property about two integers n and m. If we want to disprove the claim that "There exists an integer n such that $P(n, m)$ is true for all integers m", then we need to prove that

(a) for every integer n and every integer m, the property $P(n, m)$ is false

(b) there exists an integer n such that $P(n, m)$ is false for all integers m

(c) for every integer m, there exists an integer n such that $P(n, m)$ is false

(d) for every integer n, there exists an integer m such that $P(n, m)$ is false

9. Let $P(n, m)$ be a property about two integers n and m. If we want to disprove the claim that "For every integer n, there exists an integer m such that $P(n, m)$ is true", then we need to prove that

(a) for every integer n and every integer m, the property $P(n, m)$ is false

(b) there exists an integer n such that $P(n, m)$ is false for all integers m

(c) for every integer m, there exists an integer n such that $P(n, m)$ is false

(d) there exists an integer m such that $P(n, m)$ is false for all integers n

10. Let $P(n, m)$ be a property about two integers n and m. If we want to prove that "For every integer n, there exists an integer m such that $P(n, m)$ is true", then we should do the following

(a) Let n and m be arbitrary integers. Then show that $P(n, m)$ is true.

(b) Find an integer m such that $P(n, m)$ is true for every integer n.

(c) Let n be an arbitrary integer. Then find an integer m (possibly depending on n) such that $P(n, m)$ is true.

(d) Find an integer n and an integer m such that $P(n, m)$ is true.

11. Let A be the set $\{f(x) \mid 0 < x < 1\}$. What does it mean if we say that y is an element of A?

(a) y is between 0 and 1

(b) $f(y)$ is between 0 and 1

(c) $f(y)$ is an element of A

(d) None of the above

12. Suppose in a set of four alternatives $\{x, y, z, w\}$, x and y are Pareto-optimal while z and w are not. From this, we can infer that

(a) x is Pareto-superior to z

(b) x is Pareto-superior to w

(c) x is Pareto-superior to both z and w

(d) None of the above

13. Let $S = \{x, y, z, w\}$. Suppose x is the only Pareto-optimal alternative in S. From this, we can infer

(a) y and z are Pareto-comparable

(b) y and x are Pareto-comparable

(c) y and z are Pareto-incomparable

(d) y and x are Pareto-incomparable

14. In the Solow growth model, per capita income grows at the

(a) warranted rate of growth

(b) natural rate of growth

(c) rate of growth of labour augmenting technical progress

(d) All of the above

15. A downward shift in the Engel curve indicates

(a) a fall in the price of food

(b) a rise in real income

(c) an increase in income inequality

(d) None of the above

16. The GDP of a country is growing at 5%, its population growth is 2% and its income elasticity for food is 0·5. We can expect food demand to grow at

(a) 2·0 percent

(b) 2·5 percent

(c) 3·5 percent

(d) 5·0 percent

17. The primary deficit is

(a) total expenditure less total revenue receipts

(b) revenue expenditures less total revenue receipts

(c) gross fiscal deficit less payment of interest

(d) None of the above

18. When does an economy satisfy the 'small country' condition in international trade?

(a) If its exports and imports are small relative to world trade

(b) If how much it exports and imports is insensitive to world trade prices

(c) If its export and import prices are insensitive to how much it exports and imports

(d) None of the above

19. A closed economy produces many goods under perfect competition, all with constant returns to scale and with labour as the only non-produced input in any production. Equilibrium relative prices in this economy will be determined by

(a) only the labour theory of value

(b) only production side equations, irrespective of actual consumer tastes

(c) only demand side equations, irrespective of actual technological coefficients

(d) both technology and consumer tastes since supply and demand must equate

20. Which condition is not necessary for ordinary least squares to be the best linear unbiased estimator (BLUE)?

(a) All errors are normally distributed

(b) All errors are independent and uncorrelated to each other

(c) All errors have expectation zero

(d) All errors have the same variance

21. Which of the following is not an assumption in Heckscher-Ohlin-Samuelson model?

(a) Fixed factors in each country

(b) Factors are perfectly mobile across sectors

(c) Factors are perfectly mobile across sectors and across countries

(d) Goods and factor markets are perfectly competitive

22. For measuring purchasing power parity of the Rupee in terms of US dollar, we need data on

(a) value of goods and services produced in India and the US

(b) figures for exports and imports of India and the US

(c) foreign investment inflows in India and the US

(d) All of the above

23. Tier 1 capital under Basel capital adequacy norms of a bank is

(a) equity capital and published reserves

(b) all forms of debt

(c) all assets shown in the balance sheet

(d) all assets, excluding the identified non-performing assets

24. The impasse in the World Trade Organization in 2014 was due to

(a) liberalization of trade in goods

(b) food security concerns raised by developing countries

(c) differences between developed and developing countries on non-tariff barriers

(d) All of the above

25. If the components of a country's balance of payments are (i) balance on goods and services account; (ii) net investment from abroad; (iii) net investment income; (iv) net external aid, then the current account balance is

(a) sum of (i) and (iii)

(b) sum of (i), (ii) and (iii)

(c) sum of (i), (ii) and (iv)

(d) sum of all the components

Direction : For Question Nos. **26** to **30**, refer to the following passage :

Manufacturers have to do more than build large manufacturing plants to realize economies of scale. It is true that as the capacity of a manufacturing operation rises, costs per unit of output fall as plant size approaches 'minimum efficient scale', where the cost per unit of output reaches a minimum, determined roughly by the state of existing technology and size of the potential market. However, minimum efficient scale cannot be fully realized unless a steady 'throughput' (the flow of materials through a plant) is attained. The throughput needed to maintain the optimal scale of production requires careful coordination not only of the flow of goods through the production process, but also of the flow of input from suppliers and the flow of output to wholesalers and final consumers. If throughput falls below a critical point, unit costs rise sharply and profits disappear. A manufacturer's fixed costs and 'sunk costs' (original capital investment in the physical plant) do not decrease when production declines due to inadequate supplies of raw materials, problems on the factory floor, or inefficient sales networks. Consequently, potential economies of scale are based on the physical and engineering characteristics of the production facilities—that is, on tangible capital—but realized economies of scale are operational and organizational, and depend on knowledge, skills, experience, and teamwork—that is, on organized human capabilities, or intangible capital.

The importance of investing in intangible capital becomes obvious when one looks at what happens in new capital-intensive manufacturing industries. Such industries are quickly dominated, not by the first firms to acquire technologically sophisticated plants of theoretically optimal size, but rather by the first to exploit the full potential of such plants. Once some firms achieve this, a market becomes extremely hard to enter. Challengers must construct comparable plants and do so after the first movers have already worked out problems with suppliers or with new production processes. Challengers must create distribution networks and marketing systems in markets where first movers have all the contacts and know-how. And challengers must recruit management teams to compete with those that have already mastered these functional and strategic activities.

26. The passage suggests that in order for a manufacturer in a capital-intensive industry to have a decisive advantage over competitors making similar products, the manufacturer must

(a) be the first in the industry to build production facilities of theoretically optimal size

(b) make every effort to keep fixed and sunk costs as low as possible

(c) be one of the first to operate its manufacturing plants at minimum efficient scale

(d) produce goods of higher quality than those produced by direct competitors

27. According to the passage, which of the following is true of a manufacturer's fixed and sunk costs?

(a) The extent to which they are determined by market conditions for the goods being manufactured is frequently underestimated

(b) If they are kept as low as possible, the manufacturer is very likely to realize significant profits

(c) They are the primary factors that determine whether a manufacturer will realize economies of scale

(d) They are not affected by fluctuations in a manufacturing plant's throughput

28. In the context of the passage as a whole, the second paragraph serves primarily to

(a) provide an example to support the argument presented in the first paragraph

(b) evaluate various strategies discussed in the first paragraph

(c) introduce evidence that undermines the argument presented in the first paragraph

(d) anticipate possible objections to the argument presented in the first paragraph

29. The passage LEAST supports the inference that a manufacturer's throughput could be adversely affected by

(a) a mistake in judgment regarding the selection of a wholesaler

(b) a breakdown in the factory's machinery

(c) a labour dispute on the factory floor

(d) an increase in the cost per unit of output

30. The primary purpose of the passage is to

(a) point out the importance of intangible capital for realizing economies of scale in manufacturing

(b) show that manufacturers frequently gain a competitive advantage from investment in large manufacturing facilities

(c) argue that large manufacturing facilities often fail because of inadequate investment in both tangible and intangible capital

(d) suggest that most new industries are likely to be dominated by firms that build large manufacturing plants early

PART—B

Each question carries 2 marks

31. A stratified sample of households is selected for a survey. The population is divided in two strata. 25 percent of households in stratum A and 10 percent of households in stratum B are selected through a process of random selection. Data collected in the survey show that the incomes of sample households are as follows :

Stratum A : 2000, 1000, 3000, 4000, 5000

Stratum B : 500, 100, 200, 300, 400, 100

The average income of households in the population is

(a) 1509

(b) 1650

(c) 950

(d) None of the above

32. If a normal distribution has mean 200 and standard deviation 20, find K so that the probability that a sample value is less than K is 0·975.

(a) 239

(b) 204

(c) 210

(d) 215

33. If the estimator T_n is such that $E(T_n) = \mu$ and $\text{var}(T_n) = c/n$, where $c > 0$, which one of the following is true?

(a) T_n^2 is consistent and unbiased for μ^2

(b) T_n^2 is consistent but not unbiased for μ^2

(c) T_n^2 is unbiased but not consistent for μ^2

(d) T_n^2 is neither consistent nor unbiased for μ^2

34. The random variable X has two properties (i) the mean of X is 2 and (ii) the mean of X^2 is 9. What is the variance of $4X$?

(a) 80

(b) 20

(c) 144

(d) 112

35. Among twenty-five articles, eight are defective, six have only minor defects and two have major defects. Determine the probability that an article selected at random has major defects given that it has defects.

(a) 0·08

(b) 0·25

(c) 1/3

(d) 0·24

36. Consider the payoff matrix given below :

		Player 2	
		L	*R*
Player 1	*U*	1, 1	0, 3
	D	–3, 0	0, 0

In the above game

(a) Player 2 has a weakly dominant strategy but Player 1 does not

(b) Player 1 has a weakly dominant strategy but Player 2 does not

(c) none of the players has any weakly dominant strategy

(d) U is Player 1's weakly dominant strategy and R is Player 2's weakly dominant strategy

37. Consider a market with two firms that produce identical products. Let $q = 10 - p$ be the total quantity sold when the price is p. If both firms charge the same price, then each sells one-half of the total demand at that price. If the firms charge different prices, then the firm with the lower price sells everything. Assume that each firm has enough capacity to produce the entire amount of the output for the market at any price. Both firms have identical cost functions. The variable cost is given by $2x$ (where x is the output produced) and the fixed cost is 1. In a price setting game

(a) both firms quoting a price equal to 2 is a pure strategy Nash equilibrium

(b) both firms quoting a price equal to 1 is a pure strategy Nash equilibrium

(c) both firms quoting a price equal to 1·5 is a pure strategy Nash equilibrium

(d) there is no pure strategy equilibrium

38. Let $g(x)$ and $f(x)$ be differentiable functions defined over $[0, \infty)$. It is given that $g(0) = f(0) = 0$ and $g'(x) > f'(x)$ for all x in the open interval $(0, \infty)$. Then

(a) $g(x) < f(x)$ for all $x > 0$

(b) $g(x) > f(x)$ for all $x > 0$

(c) $g(x) < f(x)$ for $0 < x < 2$ and $g(x) > f(x)$ for all $x > 2$

(d) $g(x) = f(x)$ for all $x > 0$

39. Let $S = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \cdots$. Then S is equal to

(a) 2

(b) 4

(c) 6

(d) The sum does not converge to any finite value

40. If you integrate $1/x$ over the interval $[1, y]$, where $y > 1$, you get

(a) $\log y$ (which is the natural logarithm of y)

(b) $\log(y+1)$ (which is the natural logarithm of $y+1$)

(c) e^y

(d) None of the above

41. In a very crowded city, rents for two-room apartments were thought to be very high. The long-run supply curve of such apartments was given by $q = 11 + 3p$ while the long-run demand was given by $q = 177 - 2p$. p and q have the usual interpretation of price (rent per week, say) per apartment and quantity of apartments respectively. The civic authorities decide that rent should not exceed more than $p = 26$ per week and decided to compensate landlords so as to equate demand to supply. How much would the civic authorities have to pay per week per apartment to equate demand and supply?

(a) 12

(b) 6

(c) 9

(d) 24

42. A monopolist faces a demand curve given by $q = 3p^{-0.5}$; the monopolist can produce any amount of the output at ₹ 3 per unit. For this situation

(a) maximization of profits is impossible

(b) marginal revenue is positive but less than 3

(c) marginal cost is less than marginal revenue

(d) the average cost is downward sloping

Direction : For Question Nos. **43** to **46**, refer to the following information :

A relation f from set X to set Z is a function if and only if for every element x in X there is an unique element z in Z such that x and z are associated through f. X is called the domain of f and Z the co-domain of f. The range of f is the set of all elements in the co-domain which are associated with at least one element in the domain. f is a surjective function if and only if every element in the co-domain has an association in the domain. f is an injective function if and only if no two distinct elements in the domain are associated with the same element in the co-domain. f is a bijective function if and only if it is surjective as well as injective.

Now consider the following statements :

(i) There exists an element x in the domain of f such that no element in the co-domain is associated with it.

(ii) There exists an element x in the domain of f and two distinct elements z and w in the co-domain of f such that both z and w are associated with x.

43. Which of the following is true?

(a) To prove that f is not a function it is necessary to demonstrate (i)

(b) To prove that f is not a function it is necessary to demonstrate (ii)

(c) To prove that f is not a function it is necessary to demonstrate (i) or (ii)

(d) None of the above

44. Which of the following is true?

(a) Demonstration of (i) is sufficient to prove that f is not a function but demonstration of (ii) is not sufficient to prove that f is not a function

(b) Demonstration of (ii) is sufficient to prove that f is not a function but demonstration of (i) is not sufficient to prove that f is not a function

(c) Demonstration of (i) and (ii) is sufficient to prove that f is not a function

(d) None of the above

45. Which of the following is true?

(a) The range of a surjective function is always equal to its co-domain

(b) The range of a surjective function is never equal to its co-domain

(c) The range of a surjective function is equal to its co-domain only if it is injective also

(d) One of the conditions under which the range of a surjective function is equal to its co-domain is that the function is injective also

46. Let X be the set of all ordered pairs of real numbers and Z be the set $\{0, 1\}$. Let the relation f from X to Z be defined as follows :

$$f(x, y) = 0; \text{ if } x = y$$

$$f(x, y) = 1; \text{ if } x \neq y$$

Which of the following is true?

(a) f is not a function

(b) f is a function but it is not surjective

(c) f is a function but it is not injective

(d) f is a bijective function

47. When the prevailing annual interest rate in US is 5%, from the point of view of an US investor, would it be worth investing in a country where expected rate of return from an investment project is 25% per annum and the expected rate of depreciation of currency of that country *vis-à-vis* US$ is 20%? [Let us assume that the relative price remains the same and the other risks apart from the risk of exchange rate fluctuations are nil.]

(a) The investor would be indifferent

(b) No, it is not worth investing

(c) Yes, it is still worth investing

(d) Cannot say anything

48. Given that the government expenditure is 30% of GDP for some economy, the value of the government expenditure multiplier is 4 and the revenue elasticity/buoyancy happens to be 1·2, ceteris paribus, if the government increases expenditure, the fiscal deficit to GDP ratio would

(a) remain the same

(b) increase

(c) decrease

(d) Cannot say anything

49. If the payment system in an economy is transformed from monthly to weekly payments for all the individuals, ceteris paribus, what would be the likely impact of this policy change on the average money holding and the velocity of circulation of money for a given level of output and prices?

(a) Both would remain unchanged

(b) Average money holding would increase and velocity would reduce

(c) Both would increase

(d) Average money holding would reduce and velocity would increase

50. Consider a closed economy where all production is undertaken by the firms, wages and profits are the only two categories of income, all wages are consumed and there is no consumption out of profits. In such an economy if the level of wages and profits in a year are ₹ 50,000 and ₹ 30,000 respectively, then which of the following statements cannot be true?

(a) The total sales of all the firms were in excess of ₹ 80,000

(b) Gross domestic product in that year was ₹ 85,000

(c) Gross capital formation was ₹ 30,000, while increase in stocks and depreciation were both ₹ 3,000 each

(d) Net fixed capital formation was ₹ 30,000

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SPACE FOR ROUGH WORK

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