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ENTRANCE EXAMINATION, 2012

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) Answer all the 70 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 wrong answer.
- (v) Each correct answer carries 1 mark. **There will be negative marking and 1/4 mark will be deducted for each wrong answer.**
- (vi) Answer written by the candidates inside the Question Paper will not be evaluated.
- (vii) Pages at the end have been provided for Rough Work.
- (viii) 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
<input type="radio"/> (a) <input type="radio"/> (b) <input type="radio"/> (c) <input type="radio"/> (d)	<input checked="" type="radio"/> (a) <input type="radio"/> (b) <input type="radio"/> (c) <input type="radio"/> (d)	<input checked="" type="radio"/> (a) <input checked="" type="radio"/> (b) <input type="radio"/> (c) <input type="radio"/> (d)	<input checked="" type="radio"/> (a) <input type="radio"/> (b) <input type="radio"/> (c) <input checked="" type="radio"/> (d)	<input type="radio"/> (a) <input type="radio"/> (b) <input checked="" type="radio"/> (c) <input type="radio"/> (d)

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.**

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1. The sampling distribution refers to
 - (a) the distribution of the various sample sizes which might be used in a given study
 - (b) the probability distribution of a statistic
 - (c) the distribution of the values of the items in the population
 - (d) the distribution of the values of the items actually selected in a given sample

2. A student discovers that his grade on a recent test was at the 72nd percentile. If 90 students wrote the test, then approximately how many students received a higher grade than he did?
 - (a) 65
 - (b) 25
 - (c) 72
 - (d) 71

3. The chances that you will be booked for illegal parking in the central market are $\frac{1}{3}$. During the last nine days, you have illegally parked every day and have not been booked. On the tenth day, you again decide to park illegally. The chances that you will be caught are
 - (a) greater than $\frac{1}{3}$
 - (b) less than $\frac{1}{3}$
 - (c) equal to $\frac{1}{3}$
 - (d) equal to $\frac{9}{10}$

4. Beena's average score after 8 class tests is 84. In her first seven class tests, Beena's average score was 85. In her last class test, Beena scored
 - (a) 82
 - (b) 81
 - (c) 84
 - (d) 77

For the next four questions, Nos. 5 to 8, consider the following :

Y and X are random variables. Assume that the data generating process is as follows :

$Y = \alpha + \beta X + u$, where (i) α and β are parameters and (ii) u is an error term with mean zero that is uncorrelated with X .

Your dataset consists of the following 10 observations :

Y	2	4	6	-1	4	1	4	4	4	2
X	3	3	3	3	3	5	5	5	5	5

Given the above dataset, you estimate α and β by ordinary least squares. Let $\hat{\alpha}$ and $\hat{\beta}$ denote respectively the estimates of α and β .

5. The value of $\hat{\beta}$ is equal to

- (a) 4
- (b) 1
- (c) 2
- (d) None of the above

6. The value of $\hat{\alpha}$ is equal to

- (a) 3
- (b) 5
- (c) 2
- (d) None of the above

7. The coefficient of determination (i.e., R^2) is equal to

- (a) 1
- (b) 0
- (c) $1/2$
- (d) $2/3$

8. The expected value of Y given $X = 7$ is equal to

- (a) 7
- (b) 14
- (c) 3
- (d) 0



9. The set of all subsets of the set of all subsets of the empty set is
- (a) the empty set
 - (b) a set having a single element
 - (c) a set having two elements
 - (d) None of the above
10. The condition used to assess the likely impact of a currency devaluation on the balance of trade of a country is
- (a) the Hawkins-Simon condition
 - (b) the Modigliani-Miller condition
 - (c) the Arrow-Debreu condition
 - (d) the Marshall-Lerner condition
11. The capital adequacy ratio for banks included in the Basel Guidelines is defined as
- (a) the ratio of a bank's equity to its total lending
 - (b) the ratio of a bank's equity to its total deposits
 - (c) the ratio of equity and other specified forms of capital to the total assets of the bank
 - (d) the ratio of equity and other specified forms of capital to the sum of assets weighted by an index of risk



For the next five questions, Nos. 12 to 16, consider the following :

Consider the Solow growth model with no technical progress, a constant rate of depreciation of capital d , a constant rate of growth of the labour force n and an intensive production function $y(t) = A \ln[1 + k(t)]$, where A is a positive constant, $y(t)$ is output per unit of labour at time t and $k(t)$ is capital per unit of labour at time t . Suppose we replace the assumption of a constant saving rate in the economy by the assumption that workers earn only wage income and consume their entire income while the remaining income accrues to non-workers who save their entire income. Assuming that factor rentals are equal to respective marginal products, answer the following questions :

12. Suppose the parameters n and d have the values 0.02 and 0.05 respectively. Which of the following is a necessary and sufficient condition for the existence of a steady state growth path (with positive output) in the model?
- (a) $A > 0.07$
 - (b) $A / (1 + A) > 0.07$
 - (c) $A / (1 + A) > 0.03$
 - (d) $\ln [A / (A - 1)] > 0.07$
13. Suppose the parameters n and d have the values 0.01 and 0.01 respectively. Assuming that a steady state growth path exists, which of the following is a necessary condition for it to be unique and stable?
- (a) $A / (1 + A) > 0.02$
 - (b) $A / (1 + A) > 0.2$
 - (c) $\ln [A / (A - 1)] > 0.02$
 - (d) None of the above
14. Suppose Economy 1 and Economy 2 have identical values of n and d but Economy 1 has a higher value of A . Suppose in both economies there exists a unique and stable steady state growth path. Which economy has a higher rate of interest along the steady state growth path?
- (a) Both economies have the same steady state rate of interest
 - (b) Economy 2
 - (c) Economy 1
 - (d) More information is necessary to answer the question

15. Suppose Economy 1 and Economy 2 have identical values of A and d but Economy 1 has a higher value of n . Suppose in both economies there exists a unique and stable steady state growth path. Which economy has a higher rate of interest along the steady state growth path?

- (a) Both economies have the same steady state rate of interest
- (b) Economy 2
- (c) Economy 1
- (d) More information is necessary to answer the question

16. Suppose Economy 1 and Economy 2 have identical values of A and n , but Economy 1 has a higher value of d . Suppose that in both economies there exists a unique and stable steady state growth path. Which economy has a higher rate of interest along the steady state growth path?

- (a) Both economies have the same steady state rate of interest
- (b) Economy 2
- (c) Economy 1
- (d) More information is necessary to answer the question

17. Consider the following optimization problems :

(i) Maximize $f(x, y)$ subject to $x - 2y = 1$ and $3x + 2y = 11$

(ii) Minimize $f(x, y)$ subject to $x - 2y = 1$ and $3x + 2y = 11$

Which of the following is true?

- (a) The two problems have the same solution
- (b) The solutions to the two problems are different
- (c) Neither of the problems has a solution
- (d) Nothing can be said about the solutions to the problems unless the objective function is completely specified

18. In a garden, there are three kinds of roses—red, yellow and white. No matter which 9 roses are selected at least 2 of them are white; and no matter which 10 roses are selected at least 2 of them are yellow; and no matter which 11 roses are selected at least 2 of them are red. How many roses are there in the garden?
- (a) 11
 - (b) 12
 - (c) 13
 - (d) None of the above
19. Which of the following pairs of economies were India's two largest trading partners in each of the last three years (2008–09, 2009–10, 2010–11)?
- (a) China, USA
 - (b) China, UAE
 - (c) UK, USA
 - (d) Germany, USA

For the next two questions, Nos. 20 and 21, consider the following :

Suppose S be the set of all real numbers greater than 0 and less than or equal to 1. Let x be defined as any real number which is less than or equal to every number in the set S and let y be defined as any real number which is greater than or equal to any number in the set S .

20. The smallest value of y is
- (a) 0
 - (b) 1
 - (c) greater than 1
 - (d) None of the above
21. Which of the following is true?
- (a) The number which is equal to the maximum value of x belongs to the set S
 - (b) The number which is equal to the maximum value of x does not belong to the set S
 - (c) The maximum of x does not exist
 - (d) None of the above

22. The equilibrium price of water guns in a perfectly competitive market is Rs 15. Each producer has an identical production function where Long Run Average Cost (LRAC) = Marginal Cost (MC) at a value of Rs 20. What will happen to supply and price of water guns in the long run?
- (a) Each firm will continue producing where $LRAC = MC$; no entry or exit occurs
 - (b) Firms will leave the market, causing a decrease in supply until price equals Rs 20
 - (c) Firms will enter the market until supply increases to fill the extra demand
 - (d) Since equilibrium price is less than the minimum LRAC, the industry will shut down
23. Suppose in a set of 4 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

For the next 3 questions, Nos. 24 to 26, consider the following :

A student has taken 5 courses—Philosophy, Biology, Economics, Mathematics and Literature. She studies for these courses according to the following pattern :

Every week the student studies for exactly three courses.

If she studies Biology in a week, then she also studies Philosophy that week.

If she studies Economics in a particular week, then she does not study it in the following week.

In any particular week she studies not more than one of the subjects studied in the preceding week.

24. Which of the following is a possible sequence of combinations for the student in the two successive weeks?
- (a) Week 1 : Philosophy, Biology, Economics; Week 2 : Biology, Mathematics, Literature
 - (b) Week 1 : Philosophy, Biology, Mathematics; Week 2 : Philosophy, Biology, Literature
 - (c) Week 1 : Philosophy, Mathematics, Literature; Week 2 : Philosophy, Biology, Economics
 - (d) Week 1 : Biology, Mathematics, Literature; Week 2 : Philosophy, Economics, Mathematics



- 25.** If the student studies Philosophy, Biology and Economics in the first week, which of the following combinations must be studied in the third week?
- (a) Philosophy, Biology and Economics
 - (b) Philosophy, Biology and Mathematics
 - (c) Philosophy, Economics and Mathematics
 - (d) Economics, Mathematics and Literature
- 26.** If the student studies Philosophy, Literature and Mathematics in the first week, which of the following combinations must be studied in the eleventh week?
- (a) Philosophy, Literature and Mathematics
 - (b) Philosophy, Biology and Mathematics
 - (c) Philosophy, Economics and Mathematics
 - (d) Economics, Mathematics and Literature
- 27.** Transfer pricing refers to
- (a) tariffs that change the value of goods when they are traded
 - (b) the movement of factors that causes changes in price
 - (c) the over-pricing or under-pricing of goods in intra-firm cross-border trade of multinational companies
 - (d) the price at which skilled and professional workers are transferred by companies
- 28.** Which of the following may be considered to be a central tenet of monetarism?
- (a) It is difficult for the central bank to control the money supply in the economy
 - (b) A rise in the quantity of money leads to a proportionate rise in the price level in the short run
 - (c) The quantity of money does not affect real output in the long run
 - (d) The money demand function in the economy is unstable

29. Consider a two-person game where player 1 has two strategies, s and t ; and player 2 has two strategies, u and v . Suppose it is given that (s, u) is a Nash equilibrium and (t, v) is not a Nash equilibrium. From this we can infer that

- (a) at least one individual is better off in the outcome corresponding to (s, u) compared to the outcome corresponding to (t, v)
- (b) both individuals are better off in the outcome corresponding to (s, u) compared to the outcome corresponding to (t, v)
- (c) outcome corresponding to (t, v) is not Pareto-optimal
- (d) None of the above

30. Consider an economy in which—

National income is Rs 1,00,000

Net output taxes and tariffs amount to Rs 8,000

Depreciation is Rs 2,000

Net income received from abroad is Rs 5,000

The GDP at market prices (in rupees) of this economy is

- (a) 1,00,000
- (b) 1,05,000
- (c) 1,15,000
- (d) 85,000

For the next two questions, Nos. 31 and 32, consider the following :

The table below provides figures on gross fixed capital formation in current and constant (1999–2000) prices in India between 1993–94 and 1999–2000 :

Year	Current	Constant
1993–94	185402	272111
1994–95	224423	303156
1995–96	291174	352767
1996–97	318948	360490
1997–98	351713	382150
1998–99	398511	410407
1999–2000	456416	456416

31. By how much did the weighted average price of capital equipment rise between 1993–94 and 1999–2000?

- (a) 41 per cent
- (b) 47 per cent
- (c) 52 per cent
- (d) 61 per cent



- 32.** The rate of increase of capital goods prices in the period after 1996–97 relative to the period before 1996–97
- (a) was faster
 - (b) was slower
 - (c) was the same
 - (d) cannot be estimated from this table

For the next two questions, Nos. **33** and **34**, consider the following :

Let X and Z be subsets of the set of real numbers. A function f from X to Z is non-decreasing if and only if for any two elements x and y in X , x greater than y implies that $f(x)$ is greater than or equal to $f(y)$. A function f from X to Z is non-increasing if and only if for any two elements x and y in X , x greater than y implies that $f(x)$ is less than or equal to $f(y)$. A function f from X to Z is increasing if and only if for any two elements x and y in X , x greater than y implies that $f(x)$ is greater than $f(y)$.

- 33.** Which of the following is true?
- (a) A function cannot be non-decreasing as well as non-increasing
 - (b) A function is non-decreasing and non-increasing if and only if the range of the function is a singleton set
 - (c) A function is non-decreasing and non-increasing if there exist two distinct elements x and y in the domain which have the same functional value
 - (d) A function is non-decreasing and non-increasing only if there exist elements x, y, u and v in the domain such that $x > y$, $f(x) > f(y)$, $u > v$ and $f(u) < f(v)$
- 34.** Which of the following is true?
- (a) A non-decreasing function is also an increasing function
 - (b) An increasing function is also a non-decreasing function
 - (c) A non-decreasing function is not an increasing function
 - (d) An increasing function is not a non-decreasing function
- 35.** The effective rate of protection afforded to an industry in any economy is computed by comparing
- (a) value added at domestic prices with value added at border prices
 - (b) the rate of customs duty with the rate of domestic sales and excise duties
 - (c) the domestic price of output with its border price inclusive of import tariffs
 - (d) the domestic price of output with its border price excluding import tariffs

36. If the fiscal deficit in an economy increases

- (a) this will necessarily lead to an increase in the current account deficit
- (b) this will necessarily lead to an increase in inflation
- (c) this will lead to an increase in the current account deficit if there is no change in the private savings-investment balance
- (d) this has no bearing at all on the current account deficit

For the next five questions, Nos. 37 to 41, consider the following text :

"The relation between agriculture and manufacturing industry offers the clearest and simplest case of balance needed for economic growth. In a country where the peasantry is incapable of producing a surplus of food above its own subsistence needs there is little or no incentive for industry to establish itself; there is not sufficient market for manufactured goods. Conversely agricultural improvements may be inhibited by lack of a market for farm products if the non-farm sector of the economy is backward or undeveloped. Each of the two sectors must try to move forward. If one remains passive the other is slowed down.

It is important in this connection to make a clear distinction between two concepts that are frequently confused : the marketable surplus and the investable surplus. The farm sector's marketable surplus of farm products determines the volume of non-farm employment, including manufacturing and other activities. It reflects simply the farm sector's demand for non-agricultural commodities. This is the concept that is relevant for the balanced growth principle.

An investable surplus of farm products represents an act of saving in the farm sector. It can conceivably result from a transfer of surplus labourers from the farms to capital construction projects : a food surplus may then arise through forced or voluntary saving in the farm sector for maintaining the workers engaged in capital projects. This is the concept relevant to the problem of capital supply. It is obvious that even a large marketable surplus of food need not involve any saving by the farmers. It presents a very helpful inducement, but does not in itself create the means, for capital investment outside the agricultural sector."

(From Ragnar Nurkse : Balanced and Unbalanced Growth)

37. In this passage, Nurkse argues that lack of a marketable surplus in agriculture inhibits industrial growth because

- (a) it causes terms of trade to move against industry
- (b) it does not provide a market for industrial goods
- (c) agriculture depends upon industry to demand its products
- (d) the peasantry is usually incapable of producing a surplus above its own subsistence needs



38. Why does Nurkse make a distinction between marketable surplus and investable surplus in agriculture?
- (a) Because without investable surplus there cannot be balanced growth
 - (b) Because ensuring enough marketable surplus is what is necessary for balanced growth
 - (c) Because a large marketable surplus creates an inducement for capital investment
 - (d) Because a food surplus always translates into saving by the farm sector
39. According to Nurkse, agriculture's marketable surplus determines the volume of non-agricultural employment because
- (a) it represents the demand for non-agricultural goods and services
 - (b) employment has to be divided between farm and non-farm sectors according to capital intensity enabled by saving in the farm sector
 - (c) it enables the transfer of surplus labour from farms to capital construction projects
 - (d) otherwise there would be a lack of agricultural improvements
40. According to Nurkse, capital investment in non-agriculture
- (a) is directly related to the level of development of agriculture
 - (b) is directly related to saving in the farm sector
 - (c) is the difference between the investable surplus and the marketable surplus in agriculture
 - (d) has no relationship to agriculture
41. This particular argument of Nurkse
- (a) is relevant only in a closed economy
 - (b) is relevant in an open economy if there is a binding balance of payments constraint
 - (c) is relevant in an open economy if food can be easily imported and exported
 - (d) is always relevant in an open economy

42. X is a positive integer satisfying the following conditions :

- (i) $50 \leq X \leq 79$
- (ii) If X is a multiple of 2 then $50 \leq X \leq 59$
- (iii) If X is not a multiple of 3 then $60 \leq X \leq 69$
- (iv) If X is not a multiple of 4 then $70 \leq X \leq 79$

Therefore, we can infer that

- (a) $X = 55$
- (b) $X = 65$
- (c) $X = 75$
- (d) None of the above

43. In terms of current annual human-caused Greenhouse gas emissions

- (a) the US is responsible for both the highest per capita and total emissions
- (b) the US is responsible for the highest total (but not per capita) emissions
- (c) China is responsible for highest per capita and total emissions
- (d) China is responsible for the highest total (but not per capita) emissions

44. The Ricardian Equivalence Theorem has implications for the effect of

- (a) changes in government expenditure on private consumption expenditure
- (b) changes in the rate of rent on the rate of profit
- (c) changes in the productivity of land on the rate of rent
- (d) capital accumulation on the terms of trade between agriculture and industry

45. Which of the following statements is necessarily true of an economy in a liquidity trap?

- (a) A rise in real balances has no positive effect on private consumption expenditure
- (b) A rise in government expenditure does not crowd out private investment expenditure
- (c) The supply of money is determined by the demand for money in the economy
- (d) The real rate of interest is a negative constant

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For the next two questions, Nos. 46 and 47, consider the following :

There are two individuals, 1 and 2. Each individual has an initial endowment of 30. There is a machine with the following property : Should individuals 1 and 2 provide respectively endowments x_1 and x_2 to the machine, the machine first computes the aggregate contribution, $x_1 + x_2$. This done, the machine responds by providing each of the individuals fresh endowments equal to $5(x_1 + x_2)^{1/2}$. Thus the utility of individual i from the contribution profile (x_1, x_2) is $U_i(x_1, x_2) = 5(x_1 + x_2)^{1/2} + (30 - x_i)$. Note also that the endowment given to the machine by individual i , x_i , cannot exceed her initial endowment of 30.

46. Which of the following contribution profiles (x_1, x_2) maximizes the sum of the utilities of the two individuals, $U_1(x_1, x_2) + U_2(x_1, x_2)$?
- (a) (30, 30)
 - (b) (15, 15)
 - (c) (0, 25)
 - (d) None of the above
47. Suppose the individuals make their respective contributions, x_1 and x_2 , simultaneously. This means that when an individual chooses her contribution level, she is unaware of the contribution level chosen by the other person. For this simultaneous-move game, which of the following contribution profiles constitute a Nash equilibrium?
- (a) (15, 15)
 - (b) (0, 25)
 - (c) (25/8, 25/8)
 - (d) None of the above
48. In Keynes' theory of aggregate output and employment determination in the short run an increase in the equilibrium level of employment in the economy is always accompanied by
- (a) a rise in the equilibrium value of the real wage rate
 - (b) a fall in the equilibrium value of the real wage rate
 - (c) a rise in the equilibrium value of the total wage bill
 - (d) a fall in the equilibrium value of the total wage bill
49. If you minimize the function $f(x) = x^3$, subject to the condition that $0 < x < 3$, what is the optimal value of x ?
- (a) 0.1
 - (b) 0
 - (c) 0.0001
 - (d) There is no such optimal value

For the next two questions, Nos. 50 and 51, consider the following :

There is a monopolist who faces the demand function $D(p) = 2/p$

50. If the monopolist can produce any non-negative amount of output and if the cost of production is zero for all levels of output, then the optimal monopoly output is
- (a) zero
 - (b) one
 - (c) any positive level of output
 - (d) None of the above
51. If the monopolist can produce any non-negative amount of output and if the average cost of production is one for all levels of output, then the optimal monopoly output is
- (a) zero
 - (b) one
 - (c) any non-negative level of output
 - (d) No such optimal output exists
52. Let f be a twice differentiable real-valued function defined on the set of all real numbers greater than or equal to 0 and less than or equal to 1. Suppose there is a unique x^* in the domain of f at which $f'(x^*) = 0$. Which of the following is true?
- (a) f attains the maximum at x^*
 - (b) If $f''(x^*) > 0$ then f does not have a maximum value
 - (c) If $f(x^*)$ is greater than $f(0)$ and $f(1)$ then f attains the maximum at x^*
 - (d) f may not have a maximum value
53. Suppose both A and B are convex sets. Then which of the following is true?
- (a) A intersection B is always convex
 - (b) A union B is always convex
 - (c) Complement of A is always convex
 - (d) None of the above



For the next two questions, Nos. 54 and 55, consider the following :

Three teams, each consisting of two players, contested in a tournament. Players were named *A*, *B*, *C*, *D*, *E* and *F*. The teams belonged to countries *X*, *Y* and *Z*. The following information is given regarding the teams :

- (i) Players *A*, *B* and *C* all belonged to different teams
- (ii) Players *A* and *D* belonged to different teams
- (iii) Players *B* and *F* belonged to different teams
- (iv) Player *F* belonged to country *Z*
- (v) Players *A* and *F* belonged to different teams
- (vi) Player *D* belonged to country *X*
- (vii) Neither player *B* nor *C* belonged to the winning team

54. Which country won the tournament?

- (a) *X*
- (b) *Y*
- (c) *Z*
- (d) Cannot be determined on the basis of given information

55. Who was *B*'s teammate?

- (a) *D*
- (b) *E*
- (c) *F*
- (d) Cannot be determined on the basis of given information

56. Suppose *A* is a proper non-empty subset of the two-dimensional Euclidean space. Then which of the following is true?

- (a) *A* is a compact set if and only if *A* is closed and bounded
- (b) *A* is a compact set if and only if *A* is closed but not bounded
- (c) *A* is a compact set if and only if *A* is bounded but not closed
- (d) None of the above

57. Which of the following sectors contributes the most to gross domestic saving in the Indian economy?

- (a) Household sector
- (b) Private corporate sector
- (c) Public sector
- (d) None of the above

58. The variables gender, skin colour and eye colour derived from a sample of men and women in a workforce study are

- (a) continuous variables
- (b) non-ordered categorical variables
- (c) ordered categorical variables
- (d) interval scale variables

59. Suppose a consumer's preferences over commodities 1 and 2 can be represented by the utility function $U(x_1, x_2) = \min\{x_1, x_2\} + \max\{x_1, x_2\}$, where $x_1, x_2 \geq 0$. The prices of the two commodities are 1 and 2 respectively and the consumer's income is 150. Which of the following is true?
- At the optimum, the consumer should consume 150 units of commodity 1 and none of commodity 2
 - At the optimum, the consumer should consume 75 units of commodity 2 and none of commodity 1
 - At the optimum, the consumer should consume 50 units of commodity 1 and 50 units of commodity 2
 - At the optimum, the consumer should spend equal amounts on the two commodities
60. The current account of the balance of payments of a country is equal to
- the difference between exports and imports of merchandise
 - the difference between exports and imports of goods and services
 - the sum of the balance of trade and capital inflows
 - the difference between the increase in foreign reserves and capital inflows
61. Which of the following assumptions about the error term is not part of the so called 'classical assumptions' in the linear regression model?
- It has mean zero
 - Its value for any observation is independent of its value for any other observation
 - It has a standard normal distribution
 - It is independent of the explanatory variables
62. One of the primary considerations of the Reserve Bank of India in determining the nature of monetary policy is the rate of inflation in the economy. During the years 2010-11 and 2011-12 the Reserve Bank of India has
- decreased the repo rate and increased the reverse repo rate
 - decreased the reverse repo rate and increased the repo rate
 - decreased both the repo rate and the reverse repo rate
 - increased both the repo rate and the reverse repo rate
63. The European Union represents
- a monetary union
 - a market in which goods and factors are supposed to move freely within the union
 - a fiscal union
 - only a political grouping

64. The least squares estimator of the slope coefficient is unbiased means that
- (a) the estimated slope coefficient will always be equal to the true parameter value
 - (b) the estimated slope coefficient will get closer to the true parameter value as the size of the sample increases
 - (c) the estimated slope coefficient will be equal to the true parameter value if the sample is large
 - (d) if repeated samples of the same size are taken, on average the value of the estimated slope coefficient will be equal to the true parameter value
65. According to the latest large sample survey of the NSSO, between 2004–05 and 2009–10, total women's employment in the country (according to principal usual status)
- (a) increased
 - (b) decreased
 - (c) remained the same
 - (d) increased in rural areas but decreased in urban areas
66. Which of the following is true for the equation $x - \ln x = 1$?
- (a) $x = 2$ and $x = 4$ are the two solutions of the equation
 - (b) $x = 1$ is the unique solution of the equation
 - (c) The equation does not have any solution
 - (d) None of the above

For the next two questions, Nos. 67 and 68, consider the following :

Consider the following two-player simultaneous move game. Player 1 has two pure strategies, viz., 'Up' and 'Down'. Player 2 also has two pure strategies, viz., 'Left' and 'Right'. The payoff matrix is provided below. In each box the first letter is the payoff to player 1 and the second letter is the payoff to player 2.

Player 1/Player 2	Left	Right
Up	(a, b)	(c, d)
Down	(e, f)	(g, h)

67. For Player 1, the strategy 'Up' strictly dominates strategy 'Down' if and only if
- (a) $a > e$ and $c > g$
 - (b) $a > e$ and $c < g$
 - (c) $a \geq e$ and $c \geq g$
 - (d) None of the above

68. The strategy profile (Down, Right) is a pure strategy Nash equilibrium, if and only if
- (a) $g \geq e$ and $h \geq d$
 - (b) $g \geq c$ and $h \geq f$
 - (c) $g \geq e$, $g < c$, $h \geq d$ and $h \geq f$
 - (d) $g < e$ and $h < f$
69. In a world with only two goods, the slope of the Production Possibility Frontier (PPF) represents
- (a) the added efficiency of producing one good compared to another
 - (b) the opportunity cost of a technological change
 - (c) how much more one prefers the good on the Y-axis to the good on the X-axis
 - (d) the opportunity cost of producing one good in terms of the other
70. Suppose that 100 people live in a village where an election is being held. 51 villagers support the conservative candidate (A) and 49 support the liberal candidate (B). The candidate getting the most votes wins. In case of a tie the winner is decided by the toss of a fair coin. A villager gets a payoff of +10 units of utility if her favourite candidate gets elected and a payoff of -10 units of utility if the opposition candidate gets elected. But voting is a nuisance that costs voters one unit of utility. Those who stay at home and do not vote evade this cost, but are rewarded or punished just the same as those who shoulder the cost of voting.
- Which of the following statements is correct for this particular game?
- (a) In the above game nobody choosing to vote is a Nash equilibrium outcome
 - (b) In the above game there is no Nash equilibrium outcome in which everybody chooses to vote
 - (c) One pure strategy Nash equilibrium outcome is as follows :
All the supporters of the conservative candidate vote for A and all the supporters of the liberal candidate vote for B
 - (d) None of the above



ENTRANCE EXAMINATION, 2011

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) Answer all the 70 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 wrong answer.
- (v) Each correct answer carries 1 mark. There will be negative marking and 1/4 mark will be deducted for each wrong answer.
- (vi) Answer written by the candidates inside the Question Paper will not be evaluated.
- (vii) Pages at the end have been provided for Rough Work.
- (viii) 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
<input type="radio"/> (b) <input type="radio"/> (c) <input type="radio"/>	<input checked="" type="radio"/> (b) <input type="radio"/> (c) <input type="radio"/> (d)	<input checked="" type="radio"/> (b) <input type="radio"/> (c) <input checked="" type="radio"/> (d)	<input type="radio"/> (b) <input type="radio"/> (c) <input type="radio"/>	<input type="radio"/> (a) <input type="radio"/> (b) <input type="radio"/> (c) <input checked="" type="radio"/> (d)

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.**

1. What is the probability of getting at least one six in a single throw of three unbiased dice?

(a) $1/6$

(b) $125/216$

(c) $1/36$

(d) $91/216$

2. Two squares are chosen at random on a chessboard. What is the probability that they have a side in common?

(a) $1/18$

(b) $64/4032$

(c) $63/64$

(d) $1/9$

3. Which one of the following does not define y as a function of x ?

(a) $x^2 + y = 16$

(b) $y = (x - 3)^2 - 1$

(c) $x + y = 3$

(d) $x = y^2$

Question Nos. 4-6 are to be answered on the basis of the following information :

Let X and Y be random variables with $E[X] = 1$, $\text{var}[X] = 2$, $E[Y] = 10$, $\text{var}[Y] = 4$ and $\text{cov}(X, Y) = 2$.
Let $U = X + Y$ and $W = 2X + 3Y$.

4. $E[W]$ is

- (a) 32
- (b) 11
- (c) 2
- (d) 30

5. $\text{var}[W]$ is

- (a) 68
- (b) 44
- (c) 48
- (d) 16

6. $\text{cov}[U, W]$ is

- (a) 26
- (b) 0
- (c) 1
- (d) -26

7. Suppose we know that $|a - L| \leq c$ and $|b - L| \leq d$. Which of the following statements will be enough to imply that $|a - b| < e$?

- (a) $c + d < e$
- (b) Either $d < c + e$ or $c < d + e$
- (c) $c + d \leq e$
- (d) $|c - d| < e$

Question Nos. 8-12 are to be answered on the basis of the following information :

An exclusive club is trying to pick its members from the social elite. An exact election mechanism has been agreed upon that will ensure the entrance of only the most suave members from the Groups A, B, C, D, E, F, G and H. Being 'in' or 'out' of the club is determined by the following rules :

If A is in, then G is out.

If H is out, then B is in.

If D is out, then E is out.

If H is in, then C is in.

If B is out, then G and D are out.

8. Which of the following is a complete group of people who could be in?

- (a) A, F, G
- (b) F, G, H, C, E, D
- (c) E, D, H, C, B
- (d) G, D, F, E

9. If B is out, then who must be in?

- (a) A
- (b) C
- (c) D
- (d) E

10. If E and G are in the club, then what other two people must also be in the club?

- (a) B, A
- (b) G, H
- (c) C, F
- (d) D, B

11. If B and D are out of the club, then which of the following must be true?
- (a) At least two people are in the club
 - (b) At least three people are in the club
 - (c) At most four people are out of the club
 - (d) At most five people are out of the club
12. If seven people are in the club, then who could be out?
- (a) A
 - (b) B
 - (c) E
 - (d) C
13. Suppose $u(x, y)$ and $v(x, y)$ are two utility functions. If both $u(x, y)$ and $v(x, y)$ are homogeneous of degree r , then $s(x, y) = u(x, y) + v(x, y)$ is
- (a) homogeneous of degree r
 - (b) homogeneous of degree $(r - 1)$
 - (c) homogeneous of degree zero
 - (d) None of the above
14. A monopolist faces a demand curve $q(p) = 1/p$. He incurs a cost of Rs 3 per unit of output produced. There is no fixed cost. His optimal output choice is
- (a) 2
 - (b) 3
 - (c) 0
 - (d) No such optimal output exists

15. Let x , y and ϵ denote real numbers. If $x < y + \epsilon$, for all $\epsilon > 0$, then

- (a) $x > y$
- (b) $x \leq y$
- (c) $x > 0$
- (d) Cannot say anything from the given information

16. Consider the following statements about a two-person simultaneous-move game in which each person has two pure strategies :

- (i) If the game has a unique Nash equilibrium which is Pareto-dominated by some other strategy profile, then it is a prisoners' dilemma game.
- (ii) If the game is a prisoners' dilemma game, then it has a unique Nash equilibrium which is Pareto-dominated by some other strategy profile.

Which of the following is true?

- (a) (i) is true but (ii) is false
- (b) (i) is false but (ii) is true
- (c) Both (i) and (ii) are true
- (d) Both (i) and (ii) are false

17. The sum of the twelve vectors that go from the centre of a clock to the hours 1:00, 2:00, ..., 12:00

- (a) is the null vector $(0, 0)$
- (b) is the sum vector $(1, 1)$
- (c) is the vector (s, s) , where s = the sum of the integers from 1 to 12
- (d) is the vector (t, t) , where t = the average of the integers from 1 to 12

18. The sample mean is an unbiased estimator for the population mean. This means
- (a) the sample mean always equals the population mean
 - (b) the average sample mean, over all possible samples, equals the population mean
 - (c) the sample mean is always very close to the population mean
 - (d) None of the above
19. Supreme Court refused to hear a challenge to High Court's decision approving a trial judge's refusal to allow a defendant to refuse to speak.
Which of the following is true?
- (a) The defendant has the right to speak
 - (b) The defendant does not have the right to speak
 - (c) Whether the defendant has the right to speak or not cannot be determined on the basis of the given statement
 - (d) None of the above
20. In a simple linear regression model the slope coefficient measures
- (a) the elasticity of Y with respect to X
 - (b) the change in Y which the model predicts for a unit change in X
 - (c) the ratio Y/X
 - (d) the value of Y for any given value of X

21. The best way to recognize whether or not a variable is growing exponentially over time is by
- (a) plotting the variable against time and looking for a straight line pattern
 - (b) calculating the least squares regression line of the variable against time and examining the residuals
 - (c) plotting the logarithm of the variable against time and looking for a straight line pattern
 - (d) plotting the variable against time and looking for a non-linear pattern
22. Suppose $u(x, y)$ and $v(x, y)$ are two utility functions. If both $u(x, y)$ and $v(x, y)$ are quasi-concave, then $m(x, y) = \min\{u(x, y), v(x, y)\}$
- (a) is quasi-concave
 - (b) is quasi-convex
 - (c) is quasi-concave, if $x < y$ and quasi-convex, if $x > y$
 - (d) None of the above

Question Nos. 23 and 24 are to be answered on the basis of the following information :

Let f and g be two functions defined for all real numbers, where $f(x) = 1 + x$ and $g(x) = 1 - x$.

23. $g\{f(2)\} =$

- (a) -1
- (b) -2
- (c) 2
- (d) 3

24. $g(t)f(-t) =$

- (a) $1 - t^2$
- (b) $1 + t^2$
- (c) $(1 - t)^2$
- (d) $(1 + t)^2$

25. Let X, Y, Z be statements. Suppose we know that X implies Y , and that Y implies Z . If we also know that X is false, we can conclude that
- Y is false
 - Z is false
 - Both Y and Z are false
 - None of the above
26. Under the assumption that the market rate of interest is 10%, what is the present discounted value of the following stream of returns?
- At the end of first year—Rs 2,000
 At the end of second year—Rs 4,000
 At the end of third year—Rs 5,000
- Rs 8,880
 - Rs 10,000
 - Rs 9,275
 - Rs 9,880
27. Let x and y be two arbitrary real numbers. Consider the following two statements :
- If x and y are both irrational numbers, then $x + y$ is also an irrational number.
 - If x and y are both irrational numbers, then xy is also an irrational number.
- Both (i) and (ii) are true
 - Both (i) and (ii) are false
 - (i) is true and (ii) is false
 - (i) is false and (ii) is true
28. If the saving propensity is 14%, the increment capital output ratio is 4, the population rate of growth is 3%, there is no technical progress, and there are constant returns to scale, then
- warranted rate of growth is greater than the natural rate of growth
 - warranted rate of growth is less than the natural rate of growth
 - warranted rate of growth is equal to the natural rate of growth
 - None of the above

29. India's share in the world's manufacturing output in 1900 and 1750 was respectively
- (a) 7% and 25%
 - (b) 25% and 55%
 - (c) 2% and 55%
 - (d) 2% and 25%
30. Suppose one wishes to prove that 'if all X are Y , then all Z are W '. To do this, it would suffice to show that
- (a) all Z are X , and all W are Y
 - (b) all Y are Z , and all W are X
 - (c) all X are Z , and all Y are W
 - (d) all Z are X , and all Y are W
31. Let X and Y be statements. If we want to disprove the claim that ' X implies Y ', we need to show that
- (a) X is false
 - (b) Y is false
 - (c) X is true, but Y is false
 - (d) Y is true, but X is false
32. Let X and Y be statements. Which of the following strategies is not a valid way to show that ' X implies Y '?
- (a) Show that some statement Z implies Y , and then show that X implies Z
 - (b) Show that either X is false, or Y is true, or both
 - (c) Assume that X is false, and Y is true, and deduce a contradiction
 - (d) Assume that X is true, and Y is false, and deduce a contradiction
33. Let X and Y be statements. If we know that X implies Y , then we can also conclude that
- (a) X is true, and Y is also true
 - (b) if X is false, then Y is false
 - (c) if Y is true, then X is true
 - (d) if Y is false, then X is false

Question Nos. 34–36 are to be answered on the basis of the following pay-off matrix, where each of the two players 1 and 2 have two pure strategies each :

		Player 2	
		β_1	β_2
Player 1	α_1	(1, 1)	(2, 1)
	α_2	(1, 2)	(2, 2)

34. Determine, which one is correct

- (a) (α_1, β_1) is not a Nash equilibrium
- (b) (α_2, β_2) is not a Nash equilibrium
- (c) (α_1, β_2) is not a Nash equilibrium
- (d) None of the above

35. Determine, which one is correct

- (a) Choice of α_1 by Player 1 and of β_1 by Player 2 leads to a Pareto-optimal situation
- (b) Choice of α_1 by Player 1 and of β_2 by Player 2 leads to a Pareto-optimal situation
- (c) Choice of α_2 by Player 1 and of β_1 by Player 2 leads to a Pareto-optimal situation
- (d) Choice of α_2 by Player 1 and of β_2 by Player 2 leads to a Pareto-optimal situation

36. In this game

- (a) all Nash equilibria are Pareto-optimal
- (b) there is no Nash equilibrium
- (c) there is no pay-off configuration which is Pareto-optimal
- (d) All strategy configurations which lead to Pareto-inefficient pay-off configurations are Nash equilibria

37. A consumer's utility function is $u(x, y) = \min\{ax, by\}$, where $a > b > 0$ and x and y are the quantities of goods 1 and 2 respectively. Both goods have the same price, namely, 1. The consumer's income is also 1. The consumer maximizes his utility subject to the budget constraint. What is his demand for good 1?
- (a) 1
 - (b) 0
 - (c) $\frac{ab}{a+b}$
 - (d) $\frac{b}{a+b}$
38. The function $f(x) = |x + a|$, where $1 > a > 0$ is continuous over the interval
- (a) $(-\infty, \infty)$
 - (b) $(-a, a)$ but not over $(-\infty, \infty)$
 - (c) $[-a, a]$ but not over $(-\infty, \infty)$
 - (d) $(0, 1)$ but not over $(-\infty, \infty)$
39. The function $f(x) = |x + a|$, where $1 > a > 0$ is differentiable over the interval
- (a) $(-\infty, \infty)$
 - (b) $(-a, a)$
 - (c) $[-a, a]$
 - (d) $(-1, 1)$
40. If $\log_{10} x = a$ and $\log_2 x = b$, for some $x > 0$, then the ratio a/b is
- (a) increasing function of x
 - (b) decreasing function of x
 - (c) constant independent of x
 - (d) unless the value of x is specified we cannot say anything about the ratio
41. The function $f(x) = \log_{10} x$ is differentiable over the interval
- (a) $(-\infty, \infty)$
 - (b) $(-a, a)$, where $a > 0$
 - (c) $[-a, a]$, where $a > 0$
 - (d) $(0, 1)$

42. As $x \rightarrow +\infty$, $f(x) = x - \log_{10} x$
- (a) monotonically tends to $+\infty$
 - (b) tends to $+\infty$ but not monotonically
 - (c) monotonically tends to 0
 - (d) tends to 0 but not monotonically
43. Let $f(x) = x - 10^x$, $x > 0$. As $x \rightarrow +\infty$, $f(x)$
- (a) monotonically tends to $-\infty$
 - (b) tends to $-\infty$ but not monotonically
 - (c) monotonically tends to 0
 - (d) tends to 0 but not monotonically
44. There are three commodities—the first commodity has a negative price, -1 per unit; the second commodity is priced at $+1$ per unit, while the third is priced at $+2$ per unit. Income of the consumer is Rs 100. Determine, which one of the following is false :
- (a) It is feasible for the consumer to consume positive amounts of each of three goods
 - (b) It is feasible for the consumer to consume 100 units of good 1 and 200 units of good 2
 - (c) It is feasible for the consumer to consume nothing of goods 1 and 2 and 60 units of good 3
 - (d) It is feasible for the consumer to consume 100 units of good 1 and nothing of goods 2 and 3
45. A monopolist has an inverse demand curve given by $p = 32 - 5q$, where q stands for quantity of output and p is the price per unit of output. The monopolist has no fixed cost and his marginal cost is 7 at all levels of output.
- Which of the following expresses the monopolist's profit as a function of output?
- (a) $32 - 5q^2 - 7q$
 - (b) $32 - 10q$
 - (c) $25q - 5q^2$
 - (d) $32q - 5q^2 - 7$

46. From $a \geq b > 0$, it can be inferred that
- $(a+b)/2 \geq \sqrt{ab}$
 - $(a+b)/2 > \sqrt{ab}$
 - $(a+b)/2 \geq ab$
 - None of the above
47. A firm has a production function, $q = x + 2y$, where q , x and y denote the quantities of output, factor 1 and factor 2 respectively. If the price of the factor 1 is Rs 10 per unit while the price of the factor 2 is Rs 5 per unit, what will be the cost of producing 20 units of output?
- Rs 50
 - Rs 40
 - Rs 100
 - None of the above
48. A firm has a production function, $q = x^{\frac{1}{2}}y^{\frac{1}{2}}$, where q , x and y denote the quantities of output, factor 1 and factor 2 respectively. If the price of the factor 1 is Rs 6 per unit while the price of factor 2 is Rs 3 per unit, in what proportions the two factors should be used to maximize profits?
- $\frac{x}{y} = 1$
 - $\frac{x}{y} = 2$
 - $\frac{x}{y} = \frac{1}{2}$
 - There is insufficient information for the required calculation
49. A firm has a production function, $q = AK^{0.5}L^{1.8}$, where q , K and L denote the quantities of output, capital and labour respectively, and A is a positive constant. Such a production function exhibits
- decreasing returns to scale and diminishing marginal product of K
 - increasing returns to scale and diminishing marginal product of K
 - increasing returns to scale and increasing marginal product of K
 - constant returns to scale and increasing marginal product of L

50. A monopolist has a demand curve with constant price elasticity of absolute value 4. At the profit-maximizing level, the monopolist charges a price of Rs 60 per unit of output. What is the marginal cost at this level of output?
- (a) Rs 23.5
 - (b) Rs 136
 - (c) Rs 45
 - (d) Rs 54
51. Black economy has the following effect :
- (a) Raises the savings propensity and the investment rate in the economy
 - (b) Raises the savings propensity but lowers the investment rate in the economy
 - (c) Lowers the savings propensity and the investment rate in the economy
 - (d) Lowers the savings propensity but raises the investment rate in the economy
52. Let A and B be sets. When we say that x is not an element of $A \cap B$, it means
- (a) x belongs to neither A nor B
 - (b) x belongs to exactly one of A and B
 - (c) x does not belong to A or x does not belong to B
 - (d) None of the above
53. Let A be the set $\{f(x) | 0 < x < 1\}$. To say that y is an element of A , means
- (a) y is between 0 and 1
 - (b) $f(y)$ is between 0 and 1
 - (c) y is between $f(0)$ and $f(1)$
 - (d) None of the above
54. Let $f : X \rightarrow Y$ be a function, and let B be a subset of Y . Let x be an element of $f^{-1}(B)$. Then it follows that
- (a) x is an element of B
 - (b) $f^{-1}(B) = x$
 - (c) $f(x) = B$
 - (d) $f(x)$ is an element of B

Question Nos. 55-57 are to be answered on the basis of the following information :

Let R_i denotes the ranking (ordering) R_i of individual i over alternatives x, y, z, w ;
 $i \in \{1, 2, 3, 4, 5, 6, 7\}$.

$R_1 : (xy)zw$

$R_2 : yzwx$

$R_3 : zu(xy)$

$R_4 : (xy)(zu)$

$R_5 : yzwx$

$R_6 : zu(xy)$

$R_7 : (xy)(zu)$

(Alternatives inside the parentheses are indifferent to each other. If an alternative is written to the left of another alternative, then the former is preferred to the latter.)

55. The set of Pareto-optimal alternatives, with respect to the set of alternatives $\{x, y, z, w\}$ and the set of individuals $\{1, 2, 3, 4, 5, 6, 7\}$, is
- (a) $\{x, z\}$
 - (b) $\{y, z\}$
 - (c) $\{x, y\}$
 - (d) None of the above
56. The set of Pareto-optimal alternatives, with respect to the set of alternatives $\{x, z, w\}$ and the set of individuals $\{1, 2, 3, 4, 5, 6, 7\}$, is
- (a) $\{x, z\}$
 - (b) $\{x, w\}$
 - (c) $\{w, z\}$
 - (d) None of the above
57. The set of Pareto-optimal alternatives, with respect to the set of alternatives $\{x, y, z, w\}$ and the set of individuals $\{1, 4, 7\}$, is
- (a) $\{x, y\}$
 - (b) $\{y, z\}$
 - (c) $\{x, z\}$
 - (d) None of the above

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

- (a) $1 \subset B$
- (b) $1 \in B$
- (c) $1 \subseteq A$
- (d) None of the above

59. Between two periods in a closed economy everybody's propensity to save doubles, while investment remains unchanged. As a result

- (a) savings double
- (b) income doubles
- (c) savings remain unchanged
- (d) income remains unchanged

60. In an economy where capital and labour are the only factors of production, we have for a particular period

Capital stock : 1000

Output-capital ratio : 0.4

Employment : 200

Wage rate : 1

The rate of profit in the economy is

- (a) 5%
- (b) 10%
- (c) 20%
- (d) There is not enough information to calculate the rate of profit

61. In a rectangular array (matrix) of distinct positive numbers, which has m rows and n columns, let x denotes the largest of the smallest number in each column [i.e., $x = \text{maximum of } \{x_j | j \in \{1, 2, \dots, n\} \text{ and } x_j \text{ is the smallest number in column } j\}$] and y the smallest of the largest number in each row [i.e., $y = \text{minimum of } \{y_i | i \in \{1, 2, \dots, m\} \text{ and } y_i \text{ is the largest number in row } i\}$]. Then one can infer
- (a) $x \geq y$
 - (b) $y \geq x$
 - (c) $x = y$
 - (d) None of the above
62. Suppose in both the closed economies A and B annual real income (Y) is equal to the sum of annual real consumption expenditure (C) and annual real government expenditure (G). Suppose in both A and B , $C = 100 + 0.5Y$ and the government purchases 100 units of final goods and services per year. However, while in A the goods and services purchased by the government are used to build roads and bridges, in B they are used for birthday celebrations of public servants.
- What are the equilibrium levels of Y in A and B ?
- (a) $A: 400, B: 400$
 - (b) $A: 200, B: 200$
 - (c) $A: 400, B: 200$
 - (d) $A: 200, B: 400$
63. Current account balance of payments deficit of an open economy is
- (a) deficit of foreign trade + inflow of foreign direct investment
 - (b) imports of goods and services - exports of goods and services + depletion of foreign exchange reserve
 - (c) imports of goods and services - exports of goods and services + external assistance and foreign commercial borrowing
 - (d) imports of goods and services - exports of goods and services - net remittances out of factor incomes received from abroad

Question Nos. 64-66 are to be answered on the basis of the following para from The Economic Survey 2010 :

India is a country which will be severely impacted by climate change. This puts additional hurdles in its developmental path in addition to the challenges of poverty eradication and growing population. The projected impacts climate change cut across various sectors, natural systems such as coastal areas, water resources, forests, agriculture, and health. With a large agrarian population, India is vulnerable to changes in weather parameters. Further, rainfall, variability and melting of glaciers will impact replenishment of rivers, thereby affecting availability of water in river basins and watersheds. In India, most of the rivers flowing in the northern regions are dependent on snow and glacial melt, thus climate change threatens the perennial nature of these rivers. This has huge implications for agriculture and allied activities and resultant livelihoods. This is a serious concern for an economy that is tied to its natural resource base along its developmental path.

64. The primary issue dealt with in this para is about
- (a) population growth
 - (b) climate change
 - (c) agriculture
 - (d) glaciers
65. It is argued in the para that climate change will by itself
- (a) increase poverty
 - (b) will make no difference to poverty in India
 - (c) put hurdles in the way of poverty eradication
 - (d) reduce inequalities in society
66. It is argued in the para that climate change is a result of
- (a) large agrarian population
 - (b) India's long coast line
 - (c) lots of glaciers in the mountains
 - (d) None of the above

67. 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

Answer Question Nos. 68-70 on the basis of the following information :

Let C , I , Y , G , TR , TA , Y_d , X and M denote consumption, investment, output, government purchases, transfer payments by the government, taxes, disposable income, exports and imports respectively. Let $C = 100 + 0.8Y_d$; $I = 50$; $G = 200$; $TR = 62.5$; $TA = 0.25Y$; $X = 0$; $M = 0$.

68. Equilibrium level of Y is

- (a) 1750
- (b) 750
- (c) 1000
- (d) None of the above

69. The value of the multiplier is

- (a) 5
- (b) 2.5
- (c) 1.25
- (d) None of the above

70. The budget surplus is

- (a) -50
- (b) -137.5
- (c) -12.5
- (d) None of the above

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QUESTION PAPER
SERIES CODE

A

JNUEE: Question Papers (2006-2010) Rs.20/-

ENTRANCE EXAMINATION, 2010

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) Answer all the 70 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 wrong answer.
- (v) Each correct answer carries 1 mark. There will be negative marking and 1/2 mark will be deducted for each wrong answer.
- (vi) Answer written by the candidates inside the Question Paper will not be evaluated.
- (vii) Pages at the end have been provided for Rough Work.
- (viii) 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
<input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	<input checked="" type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	<input type="radio"/> a <input checked="" type="radio"/> b <input type="radio"/> c <input type="radio"/> d	<input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input checked="" type="radio"/> d	<input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input checked="" type="radio"/> d

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.

1. If a group of countries abolishes trade barriers between themselves and set common tariffs for other countries, this is known as
 - (a) a common market
 - (b) a customs union
 - (c) a free trade area
 - (d) a preferential trading arrangement

2. An optimal tariff is one which
 - (a) results in the optimum income for the country
 - (b) puts the economy on the full employment frontier
 - (c) maximizes the welfare gains of international price changes net of deadweight losses
 - (d) increases the trade volumes of the country

3. Transfer pricing refers to
 - (a) tariffs that change the value of goods when they are traded
 - (b) the movement of factors that causes changes in price
 - (c) the overpricing or underpricing of goods in intrafirm cross-border trade of multinational companies
 - (d) the price at which skilled and professional workers are transferred by companies

4. Technical progress is neutral according to Harrod if and only if
 - (a) the capital-labour ratio remains constant at a constant wage-rental ratio
 - (b) the capital-output ratio remains constant at a constant wage-rental ratio
 - (c) the capital-labour ratio remains constant at a constant rate of interest
 - (d) the capital-output ratio remains constant at a constant rate of interest

5. Suppose in an economy the ratio of consumption expenditure to aggregate income is constant at 0.75, the rate of growth of the labour force is constant at 2% per annum and the ICOR is constant at 6-year. The normal warranted rate of growth (per cent per annum) for the economy is equal to
- (a) 0.33
 - (b) 2.19
 - (c) 4.17
 - (d) 5.83
6. Consider the Ramsey-Cass-Koopmans version of the neo-classical growth model without technical progress. Suppose economies A and B are identical in all respects, except that households in A have a higher rate of time preference than those in B. Then, A will necessarily have
- (a) a higher steady-state level of per capita consumption
 - (b) a lower steady-state level of per capita consumption
 - (c) a higher rate of growth in steady state
 - (d) a lower rate of growth in steady state
7. Suppose the labour value of one working day of labour power is 0.6 working day of labour power. If the labour power used in the production of a commodity is 30 working days and the labour value of the means of production used up in the production of the commodity is 65 working days of labour power, then the labour value of the commodity (in working days of labour power) is equal to
- (a) 18
 - (b) 48
 - (c) 83
 - (d) 95
8. Consider an economy in which the average propensity to consume out of aggregate wage income and the average propensity to consume out of aggregate profit (non-wage) income are constant and equal to 0.9 and 0.4 respectively. The natural rate of growth in the economy is constant at 4% per annum and the capital-output ratio is constant at 4-year. What is the share of profits in aggregate income if the economy is on a balanced growth path with a constant rate of unemployment?
- (a) 12%
 - (b) 15%
 - (c) 24%
 - (d) 33%

9. Which of the following may be considered to be a central tenet of monetarism?

- (a) It is difficult for the central bank to control the money supply in the economy
- (b) Fiscal policy is a more effective instrument for stabilization than monetary policy
- (c) A rise in the quantity of money leads to a proportionate rise in the price level in the short run
- (d) The quantity of money does not affect real output in the long run

10. In Keynes' theory of determination of output and employment in the short run, a cut in the money wage rate in the economy might lead to a fall in effective demand due to which of the following reasons?

- (a) A fall in the share of wages in national income
- (b) A fall in the real wage rate
- (c) A fall in the real rate of interest
- (d) A fall in the nominal rate of interest

The next two questions (11 and 12) are based on the following paragraph :

Suppose a wealth holder decides how to allocate her wealth amongst money and bonds at the end of each year. At the end of this year the wealth holder finds that she has a bond in her possession which promises to pay a fixed amount of Rs 100 at the end of every subsequent year for perpetuity. Suppose the current rate of interest is $x\%$ per annum and the wealth holder expects the rate of interest to be 5% per annum at the end of next year.

11. What is the expected price of the bond at the end of next year (in rupees)?

- (a) 500
- (b) 1000
- (c) 1500
- (d) 2000

12. The wealth holder will be indifferent between holding the bond over the next year and selling the bond at the end of this year if the value of x is equal to

- (a) 2.75
- (b) 4.25
- (c) 4.76
- (d) 5.83

The next four questions (13, 14, 15 and 16) are based on the following paragraph :

Suppose in an economy, in equilibrium, aggregate income (in units of money per year) $Y = C + I + G$, where investment expenditure (in units of money per year) $I = 850$ and aggregate consumption expenditure (in units of money per year) C satisfies the following conditions :

- (i) C is a function of current disposable income in the economy (Y_d)
- (ii) If $Y_d = 1000$, then $C = 950$
- (iii) Marginal propensity to save out of Y_d is constant in the economy and equal to 25%

13. Suppose the government collects direct tax revenues equal to 20% of Y . Given that G denotes aggregate government expenditure (in units of money per year). What must be the equilibrium value of Y if the government wants to have a balanced budget in equilibrium?

- (a) 2625
- (b) 4800
- (c) 5250
- (d) 6000

14. Suppose the government adopts a policy that, in equilibrium, the fiscal deficit cannot be more than 5% of Y . What is the maximum value of Y which the economy can achieve in equilibrium?

- (a) 4000
- (b) 5000
- (c) 6000
- (d) 7000

15. Suppose the government adopts the policy that, in equilibrium, the fiscal deficit cannot be more than 5% of Y and simultaneously lowers the rates of direct taxes and collects only 10% of Y as revenue from direct taxes. What is the maximum value of Y which the economy can now achieve in equilibrium?
- (a) 4000
 - (b) 5000
 - (c) 6000
 - (d) 7000
16. Suppose the government makes direct transfer payments amounting to 400 units of money per year. What must be the equilibrium value of Y if the government wants to have a balanced budget in equilibrium?
- (a) 2750
 - (b) 3750
 - (c) 4750
 - (d) 5750
17. The primary deficit refers to
- (a) the deficit in the revenue account of the budget
 - (b) the deficit in the capital account of the budget
 - (c) the fiscal deficit less the interest outgo in the budget
 - (d) None of the above
18. In Solow's neo-classical growth model if the population growth rate increases, then comparing steady-state growth paths before and after the increase in population growth rate, the
- (a) growth rate of income declines, capital intensity of output declines and per capita income declines
 - (b) growth rate of income declines, capital intensity of output declines and per capita income rises
 - (c) growth rate of income rises, capital intensity of output declines and per capita income declines
 - (d) growth rate of income declines, capital intensity of output rises and per capita income declines

The next two questions (19 and 20) are based on the pay off matrix of the strategic form game given below :

		Player 2	
		H	T
Player 1	H	1, -1	-1, 1
	T	-1, 1	1, -1

19. The pure strategy Nash equilibrium of the above game is
- T, T
 - H, T
 - T, H
 - There is no pure strategy Nash equilibrium
20. The mixed strategy Nash equilibrium of the above game is
- both players choose H with probability 1/2 and T with probability 1/2
 - both players choose H with probability 3/4 and T with probability 1/4
 - both players choose H with probability 1/4 and T with probability 3/4
 - There exists no mixed strategy equilibrium
21. If the utility function takes the form $U(x, y) = \text{Max}\{x, y\}$, then the indifference curves will be
- strictly convex to the origin
 - straight lines
 - L-shaped
 - None of the above
22. In any strategic form game
- a dominant strategy equilibrium is always Nash equilibrium but the converse is not true
 - a Nash equilibrium is always a dominant strategy equilibrium but the converse is not true
 - a dominant strategy equilibrium is sometimes a Nash equilibrium and sometimes it is not a Nash equilibrium
 - a Nash equilibrium is never a dominant strategy equilibrium

23. There are three commodities—the first commodity has a negative price, -1 per unit; the second commodity is priced at $+1$ per unit while the third is priced at $+2$ per unit. Income of the person is Rs 100 per day. Then one of the following is not true. Which one?
- (a) An individual may afford to consume positive amounts of each per day
 - (b) Any individual may afford to consume $(0, 0, 60)$
 - (c) An individual may afford to consume $(20, 0, 60)$
 - (d) An individual may afford to consume $(N, N + 100, 0)$ for any number N
24. Amit inherits Rs 10,000 from a rich uncle. It is observed that even though there have been no change in prices, he continues to eat the same number of gulab jamuns per day. Then
- (a) gulab jamuns are Giffen goods for Amit
 - (b) gulab jamuns are normal goods for Amit
 - (c) Amit's Engel curve for gulab jamuns is vertical
 - (d) Amit's Engel curve for gulab jamuns is horizontal
25. A monopolist has a demand curve with constant price elasticity with absolute value 4. The monopolist charges a price of 60 per unit of output. What is its marginal cost at this level of output?
- (a) 23.5
 - (b) 136
 - (c) 45
 - (d) 54
26. 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) there is no pure strategy equilibrium but there is mixed strategy equilibrium
 - (d) there is no equilibrium, either in pure strategies or in mixed strategies

27. A firm has a production function $q = x^{0.5} y^{0.5}$. If the price of the x -factor is Rs 6 per unit while the price of the y -factor is Rs 3 per unit, what proportion of the factors should be used to maximize profits?
- (a) $x = y$
 - (b) $x = 2y$
 - (c) $x = 0.5y$
 - (d) We cannot tell without any information about the price of output
28. If the marginal rate of substitution between the two goods X and Y consumed by a household is given by $(x - a) / (y - b)$ (where x and y denote quantities consumed of X and Y respectively; $x > a, y > b$), then a possible form for the utility function of the household is
- (a) $\ln(x - a) - \ln(y - b)$
 - (b) $\ln(x - a) / \ln(y - b)$
 - (c) $(x - a)^2 / (y - b)^2$
 - (d) $(x - a)^2 + (y - b)^2$
29. A monopolist will necessarily produce a level of output which is inefficient because when it equates marginal revenue to marginal costs
- (a) price exceeds marginal costs
 - (b) price never exceeds marginal costs
 - (c) price does not cover average variable costs
 - (d) price exceeds average costs
30. A monopolist faces a demand curve given by $q = 3p^{-0.5}$; the monopolist can produce any amount of the output at Rs 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) None of the above

31. Which of the following represents the same preferences as the utility function $U(x_1, x_2) = x_1 + x_2$?

(a) $2x_1 + 2x_2$

(b) $x_1 + 2x_2$

(c) $2x_1 + x_2$

(d) $x_1^2 + x_2^2$

32. A consumer's preference over commodities 1 and 2 are given as

x is at least as good as y if and only if $[x_1 > y_1 \text{ or } (x_1 = y_1 \text{ and } x_2 \geq y_2)]$ where $x_1, y_1 \in \{0, 1, 2, 3, 4\}$ and $x_2, y_2 \geq 0$. Let $U(x_1, x_2) = 5x_1 + x_2$. Which of the following statements is correct?

(a) U is a utility function representing the consumer's preference relation

(b) U is the only utility function representing the consumer's preference relation

(c) There is no utility function representing the consumer's preference relation

(d) Any monotonic transformation of U is a utility function representing the consumer's preference relation

33. Suppose the market demand for a commodity is given by

$$D(p) = \frac{\sum_{i=1}^n M_i}{\alpha p}$$

where M_i is the income of the i th consumer and $\alpha > 0$ is some constant. The change in the total consumer's surplus corresponding to a change in the price of the commodity from e to e^2 is

(a) $\frac{\sum_{i=1}^n M_i}{\alpha} [e^2 - e]$

(b) $\frac{\sum_{i=1}^n M_i}{\alpha} [\log e^2 - \log e]$

(c) $\frac{\sum_{i=1}^n M_i}{\alpha}$

(d) $\frac{\sum_{i=1}^n M_i}{\alpha} \left[\frac{1}{e^2} - \frac{1}{e} \right]$

34. Consider sets $A = \{2, 3, 4, 9\}$ and $B = \{1, 7, 6, 4, 8\}$. Consider the relations f_1, f_2, f_3, f_4 and f_5 from A to B defined as follows

- (i) $f_1(2) = 1, f_1(3) = 6, f_1(9) = 4$
- (ii) $f_2(2) = 4, f_2(2) = 6, f_2(3) = 1, f_2(4) = 7, f_2(9) = 8$
- (iii) $f_3(2) = 8, f_3(3) = 1, f_3(4) = 4, f_3(9) = 7$
- (iv) $f_4(2) = 8, f_4(3) = 1, f_4(4) = 4, f_4(9) = 4$
- (v) $f_5(2) = f_5(3) = f_5(4) = f_5(9) = 6$

Which of the following statements is correct?

- (a) All the relations given above are functions
- (b) None of the above relations is a function
- (c) f_3, f_4 and f_5 are functions but f_1 and f_2 are not
- (d) f_1, f_2 and f_3 are functions but f_4 and f_5 are not

35. The function $f(x) = |x + a|$ where $1 > a > 0$ is differentiable over the interval

- (a) $(-a, a)$
- (b) $(-\infty, +\infty)$
- (c) $[-a, a]$
- (d) $(-1, 1)$

36. Two finite sets have m and n elements respectively. The total number of subsets of first set is 56 more than the total number of subsets of the second set. The values of m and n respectively are

- (a) 7, 6
- (b) 5, 1
- (c) 6, 3
- (d) 8, 7

37. If $a = \log_{10} x$ and $b = \log_2 x$ for some $x > 0$, then the ratio a/b is

- (a) undefined for some x
- (b) increasing function of x
- (c) decreasing function of x
- (d) constant independent of x

38. The function $f(x) = \log_{10} x$ is differentiable over the interval
- (a) $(-a, a)$ where $a > 0$
 - (b) $(-\infty, +\infty)$
 - (c) $[-a, a]$ where $a > 0$
 - (d) $(0, 1)$
39. The behavior of $f(x) = x - \log_{10} x$ as $x \rightarrow +\infty$ is given by the following
- (a) Tends to $+\infty$ monotonically
 - (b) Tends to $+\infty$ but does not behave monotonically
 - (c) Tends to zero monotonically
 - (d) Does not behave monotonically but goes to 0
40. The behavior of $f(x) = x - 10^x$, $x > 0$, as $x \rightarrow +\infty$ is given by the following
- (a) Tends to $-\infty$ monotonically
 - (b) Tends to $-\infty$ but does not behave monotonically
 - (c) May behave arbitrarily without any definite tendencies
 - (d) Tends to zero monotonically
41. If $a \cdot b = M$, M is different from 0 and $(a + b) = 4$, then
- (a) there are always real values for a, b
 - (b) whenever $4 \geq M > 0$ there are real values for a, b
 - (c) whenever $0 > M$ there are positive values for both a, b
 - (d) whenever $0 > M$ there are negative values for both a, b

42. Let $g(x)$ and $f(x)$ be differentiable functions defined over $[0, \infty)$. It's 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 $x > 0$
43. Let $f(x)$ be a differentiable function defined over the interval $[0, 2]$. It's given that $f(0) = 1$ and $f(x) \leq 0 \rightarrow f'(x) > 0$. Then
- (a) $f(x) > 0$ for all x in the interval $[0, 2]$
 - (b) $f(x) < 0$ for all x in the interval $[0, 2]$
 - (c) $f(x) = 0$ for all x in the interval $[0, 2]$
 - (d) $f(x)$ is strictly positive for all $0 < x < 1$ and $f(x)$ is strictly negative for all $1 < x < 2$

The next two questions (44 and 45) are based on the following information :

One of A , B , C and D has committed a crime with the help of another one of them. Here are the statements given by the four individuals. The statements of the criminal and his accomplice are false and those of the remaining two are true.

A : If B is guilty of something, then C must be innocent.

B : If A is innocent, then C must be guilty.

C : If B was the killer, then D must have had nothing to do with the crime.

D : I am innocent.

44. The criminal is

- (a) A
- (b) B
- (c) C
- (d) D

45. The accomplice is

- (a) A
- (b) B
- (c) C
- (d) D

46. Let x and y be two arbitrary real numbers. If

- (a) x is a rational number and y is an irrational number, then xy is an irrational number
- (b) x and y are irrational numbers, then $x + y$ is an irrational number
- (c) x and y are irrational numbers, then xy is an irrational number
- (d) x and y are irrational numbers, then x/y is an irrational number

47. Let X, Y, Z be statements. Suppose we know that 'if X then Y ' is true, and that 'if Y then Z ' is true. We also know that Y is false. We can infer that

- (a) X is true
- (b) X is false
- (c) Z is true
- (d) Z is false

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

49. One should exercise caution in 'extrapolating' a mean value of Y from a given X_0 and the regression line, as
- (a) the standard error of the mean prediction rises as X_0 moves away from \bar{X} (where \bar{X} is the mean of X observations)
 - (b) the variance of the mean prediction falls as X_0 moves away from \bar{X} (where \bar{X} is the mean of X observations)
 - (c) the error term always has higher variance at a higher value of X
 - (d) the error term is always highly autocorrelated
50. In regression analysis, a standardized stochastic variable
- (a) is formed by subtracting the mean of the observations on it from itself and dividing this difference by its standard deviation
 - (b) is always normally distributed
 - (c) always has a mean of 0 and a standard deviation of 1
 - (d) Both (a) and (c)
51. In a log-log regression model, a slope coefficient for a particular variable measures
- (a) the change in the absolute value of the dependent for a unit change in the absolute value of the variable
 - (b) the % change in the dependent for a unit change in absolute value of the variable
 - (c) the elasticity of the dependent with respect to the particular variable
 - (d) the ratio of the dependent to the independent variable
52. Assume that the mean height in a sample of 100 drawn from a population with standard deviation = 24 cm has a mean $\bar{X} = 150$ cm. The 95% confidence interval on the mean is
- (a) [148.3, 156.9]
 - (b) [142.1, 158.3]
 - (c) [140.4, 158.3]
 - (d) [145.3, 154.7]

53. The 2-variable regression output from a data set is missing several values.

$$Y_i = 2.3 \pm 0.58X_i$$

se (1.4) (?)

t-stat ? ?

It is however known that the F -statistic from the ANOVA output is 4.16. Thus we can infer that

- (a) the t -statistic on $\beta_1 = 2.8$ and the standard error of $\beta_2 = .19$
 - (b) the t -statistic on $\beta_1 = .58$ and the standard error of $\beta_2 = .28$
 - (c) the t -statistic on $\beta_1 = -2.07$ and the standard error of $\beta_2 = .50$
 - (d) the t -statistic on $\beta_1 = -1.8$ and the standard error of $\beta_2 = .38$
54. Consider two disjoint sets A and B . Let A^c and B^c be the complements of set A and set B respectively. A^c and B^c are
- (a) disjoint if $A \cup B = S$; where S is the universal set
 - (b) disjoint if $S - (A \cup B) \neq \phi$; where ϕ is the empty set
 - (c) always disjoint
 - (d) never disjoint
55. Consider the following statements about the Human Development Indices (HDI) of two countries A and B :
- (i) HDI of country A is 2 and HDI of country B is 1 implies that A is twice as developed as B .
 - (ii) HDI of country A is 0.75 and HDI of country B is 0.25 implies that A is thrice as developed as B .
- Which of the following is correct?
- (a) (i) is true and (ii) is false
 - (b) (i) is false and (ii) is true
 - (c) Both (i) and (ii) are false
 - (d) Both (i) and (ii) are true

56. Consider the following statement : If inflation increases, then unemployment decreases. Which of the following statements is equivalent?

- (a) For unemployment to decrease, inflation must increase.
- (b) If unemployment decreases, then inflation increases
- (c) Unemployment can only decrease if inflation increases
- (d) If unemployment does not decrease, then inflation does not increase

57. The spread of a flu virus through a particular population is modelled by

$$y = \frac{1000}{1 + 990e^{-0.7t}}$$

where y is the total number of people infected after t days. In how many days will 530 people be infected with the virus? (Round your answer to the nearest whole number.)

- (a) 9 days
- (b) 10 days
- (c) 11 days
- (d) None of the above

58. Two squares are chosen at random on a chessboard. What is the probability that they have a side in common?

- (a) $1/18$
- (b) $64/4032$
- (c) $63/64$
- (d) $1/9$

59. The contribution of agricultural sector to GDP in India is determined by

- (a) input-output approach
- (b) periodic surveys
- (c) crop-cutting experiments
- (d) product flow approach

60. The money multiplier in an economy increases with
- increase in Cash Reserve Ratio
 - increase in Statutory Liquidity Ratio
 - increase in banking habit of the population
 - greater cash holding by each individual in society
61. The size of the Black Economy in India in 1995-96 as a % of GDP is estimated to be
- 70%
 - 40%
 - 10%
 - 0%
62. One way in which the Heckscher-Ohlin model differs from the Ricardo model of comparative advantage is by assuming that one of the following is (are) identical in all countries. Which one?
- Factor of production endowments
 - Scale economies
 - Factor of production intensities
 - Technology
63. Assume the world consists of two countries, Home and Foreign. There are two goods, X and Y, and one factor of production, L, which can move freely between sectors but not between countries. There is perfect competition in all markets. The countries differ in available technology such as :

	Output per unit of labour	
	X	Y
Home	4	12
Foreign	10	15

There are 50 workers in Home and 25 workers in the Foreign Country. The Ricardian theory predicts that

- the Home Country produces X and Y
- the Home Country produces Y only and imports X
- the Foreign Country produces Y only and imports X
- None of the above is necessarily true

64. If in a two-sector Mahalanobis model

μ_k is the share of investment allocated to the investment goods sector

μ_c is the share of investment allocated to the consumption goods sector

β_k is the incremental output-capital ratio in the investment goods sector

β_c is the incremental output-capital ratio in the consumption goods sector

then the decision variable driving growth is

- (a) μ_k
- (b) β_k
- (c) μ_c
- (d) β_c

65. If in the above model (see Question No. 64)

$\mu_k = 0.4$; $\beta_k = \frac{1}{4}$; $\mu_c = 0.6$; $\beta_c = \frac{1}{3}$, then the marginal rate of saving is

- (a) 0.2
- (b) 0.33
- (c) 0.25
- (d) None of the above

66. In economics a network externality is seen to exist when

- (a) being part of a network improves the benefit derived from a good or agent outside the network
- (b) the existence of a particular network improves the condition of all agents outside the network
- (c) the existence of one network of agents engaged in a specific form of consumption or production results in the reproduction of that network
- (d) the benefit that a user derives from the good or service increases with the number of other agents consuming the same good or service

67. The Bombay Stock Exchange Sensitive Index or Sensex is

- (a) a simple average of the stock prices of the top 500 companies by market capitalization
- (b) a weighted average of the stock prices of the 500 most actively traded shares
- (c) a weighted average of the stock prices of the 50 most actively traded shares
- (d) a weighted average of the stock prices of a changing set of 30 actively traded stocks

68. Which of these indicators is NOT included in computing the Human Development Indices incorporated in the UNDP annual Human Development Report?

- (a) Life expectancy at birth
- (b) Adult literacy rate
- (c) Combine primary, secondary and tertiary enrolment
- (d) Head-count poverty ratio

69. In 2008-09 the share of services consisting of 'trade, hotels, transport and communication', 'financing, insurance, real estate and business services' and 'community, social and personal services' in GDP at factor cost in India was

- (a) 34 per cent
- (b) 40 per cent
- (c) 46 per cent
- (d) 54 per cent

70. The official poverty line in India is given by

- (a) the income at which individuals are seen as attaining a calorific intake of 2400 kilocalories per capita per day in rural India and 2100 kilocalories per capita per day in urban India
- (b) the consumption expenditure level at which individuals are seen as attaining a calorific intake of 2400 kilocalories per capita per day in rural India and 2100 kilocalories per capita per day in urban India
- (c) the price-inflated current price value of the consumption expenditure needed to purchase a bundle of commodities which in 1973-74 ensured a calorific intake of 2400 kilocalories per capita per day in rural India and 2100 kilocalories per capita per day in urban India
- (d) the inflated current price value of the income needed to purchase a bundle of commodities which in 1973-74 ensured a calorific intake of 2400 kilocalories per capita per day in rural India and 2100 kilocalories per capita per day in urban India

60/34

~~60/34~~