

Indian Statistical Institute, Bangalore

B. Math (Hons.) Third Year

Economics II: Themes in Development Theory and Policy

End-term Exam

Date: May 08, 2019

Maximum marks: 50

Duration: 2 hours

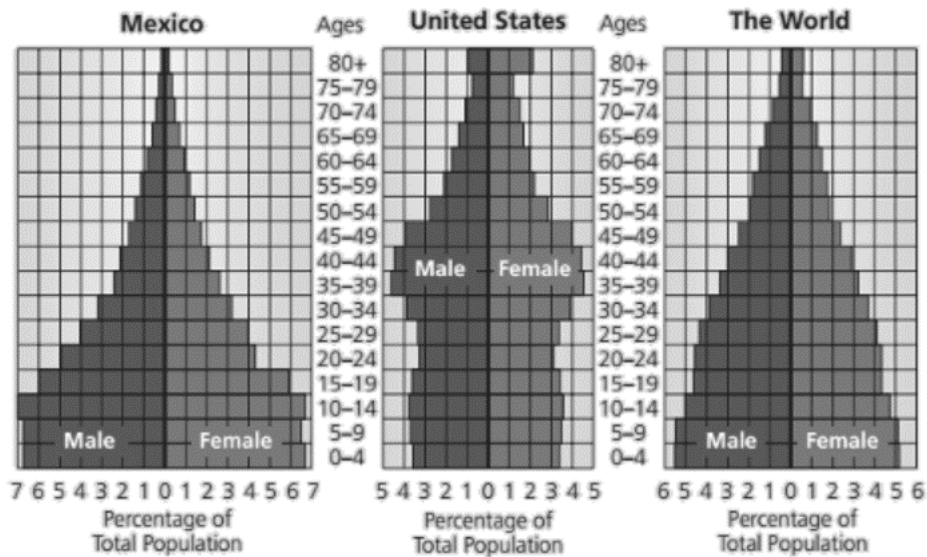
### Section A: One Mark Questions

Note down the alphabet of the correct answer

1. A megacity is:
  - a. the most developed city in a country.
  - b. an industrial hub.
  - c. a city with 10 million or more inhabitants.
  - d. a city which has 80 per cent urban population.
  
2. Localisation economies mean
  - a. external economies of scale.
  - b. positive externalities associated with the growth of a concentrated geographic region.
  - c. agglomeration effects captured by particular sectors of the economy as they grow within an area.
  - d. none of the above.
  
3. Income distribution in Country A is (100, 110, 150, 150). The poverty line is 125. The poverty gap ratio is:
  - a. 0.08
  - b. 10
  - c. 0.5
  - d. 0.16
  
4. Which one of the following represents the concept of human capital?
  - a. Total population.
  - b. Skilled workers.
  - c. Human resources gainfully employed in productive activities.
  - d. All of the above.
  
5. Improved seeds, advanced techniques of irrigation, use of fertilisers, pesticides, and advances in scientific practices in agriculture are scale-neutral. State why.

6. Sen's poverty index does not satisfy which of the following axioms:
  - a. Monotonicity
  - b. Sub-group decomposability
  - c. Weak transfer
  - d. both a and c.
  
7. If a risk-averse individual X has to choose between two investment options A and B; A, which can pay Rs.10000 or Rs. 2000 each with a probability  $\frac{1}{2}$ . The other one B, which pays Rs. 8000 in the event of success, and pays more (Rs. 4000) in the event of failure. Which one would X choose?
  - a. A
  - b. B
  - c. Expected returns are same, thus, X would be indifferent.
  - d. Limited information, cannot conclude.
  
8. Because a borrower has -----, formal banking institutions require collateral.
  - a. risk-loving attitude.
  - b. tendency to use productive loans for consumption purposes.
  - c. limited liability.
  - d. both a and c.
  
9. The unlimited supply of labour as used by Arthur Lewis refers to
  - a. The supply of labour is more than the demand for labour.
  - b. The supply of labour at the subsistence wage is greater than the demand.
  - c. Infinite labour that is available at whatever wage is determined by the market.
  - d. None of the above.
  
10. If marginal returns to the tenant exceeds 100 per cent under fixed-rent contract, the economic surplus will
  - a. fall
  - b. rise
  - c. stay the same.
  - d. cannot decide.

11. Based on the figures given below that depicts the population pyramids, the following observation can be made:



- Mexico has a higher share of elderly population compared to the US.
  - A higher percentage of women in the United States are in their childbearing years compared to Mexico.
  - A higher percentage of women in Mexico are in their prime childbearing years (15-34) compared to the US.
  - There is a lower percentage of elderly people in the US compared to the world average.
12. Which *two* of the following are most likely to be associated with an increase in the incidence of poverty?
- The Gini coefficient falls substantially.
  - The real income of those in the top 20 per cent of income earners falls by 10 per cent.
  - The number of households earning below 50 per cent of average incomes has increased substantially.
  - The number of single persons with children and of single pensioners has increased substantially.

Answer:

- i and ii
- ii and iii
- iii and iv
- ii and iv

13. Which of the following statements about income inequality is false?
- A curve which plots a cumulative percentage of income against a cumulative percentage of households is called a Lorenz curve.
  - Gross incomes are less unequal than original incomes.
  - If we compare the distribution of two incomes, the one with the lower Gini coefficient is the more unequal.
  - both b and c
14. In a fixed rent tenancy, risk is
- Borne by the tenant
  - Borne by the landlord
  - Shared between landlord and tenant
  - None of the above
15. Suppose migrants are risks averse, then in the Harris-Todaro model, in equilibrium, the expected urban wages will be \_\_\_\_\_ the rural wage rate.
- Greater than
  - Equal to
  - Less than
  - None of the above
16. Historically, low rate of population growth were maintained because of
- low fertility rates.
  - high mortality rates.
  - migration out of developing countries.
  - government restrictions on the number of children families can have.
17. According to Malthus, the fixed factor of production is
- Labour
  - Capital
  - Land
  - Entrepreneurship
18. According to the inverted U hypothesis of Kuznets, as economies develop;
- average household incomes first fall and later rise.
  - industry's share of GNP first rises and later falls.
  - income inequality first rises and later falls.
  - the population growth rate first rises and later falls.

19. If the distribution of income in country C is (1, 2, 2, 3, 5), and in country D it is (1, 1, 2, 3, 5), and the poverty line in both countries is 2.5, by the headcount measure which country has more poverty?
- C
  - D
  - poverty is the same in C and D
  - we cannot tell from the information given
20. Rural interest rates are likely to be
- Higher than in the organized credit market
  - Same as in the organized credit market
  - Lower than in the organized credit market
  - None of the above

### Section B: Two Mark Questions

21. The creation of more urban modern-sector jobs without attempts to improve rural income and employment opportunities can result in higher urban unemployment. Explain this paradox using the assumptions of Todaro model of rural-urban migration.
22. What will happen to the birth rates among the very poor if there is an increase in female wage-employment opportunities? Explain the answer with a diagrammatic presentation based on the microeconomic household theory of fertility.
23. What is Malthusian population trap? Can technological progress offset the trap?
24. Why one should address the gender gap in education? Can you give two reasons?
25. Suppose that the initial rural distribution of income is (1, 2, 3, 4) and the initial urban distribution is (3, 4). The poverty line is 2.5. What is the overall headcount ratio? Now imagine that all of the rural poor move to urban areas and each of them gains 20% in real income. What is the change in the overall poverty rate?
26. Give two reasons why child labour persists in India?

### Section C: Three Mark Questions

27. Based on the following tables, answer the questions given below.

Table 1 *Number of persons attending school in India in 2011 by age-group, sex and sector, in millions*

	Age group	Total persons			Attending school		
		Persons	Male	Female	Persons	Male	Female
<b>Urban</b>	6-9	26.36	13.89	12.47	20.66	10.91	9.75
	10-14	35.90	18.93	16.97	31.88	16.85	15.03
<b>Rural</b>	6-9	74.51	38.69	35.83	55.29	28.99	26.30
	10-14	96.80	50.49	46.32	83.06	44.00	39.05
<b>Total</b>		233.58	121.99	111.59	190.88	100.76	90.13

Source: Census of India 2011

Table 2 *Working children in India in 5 to 14 age group in 2001 and 2011 by year and sector, in per cent and number*

Year	Percentage of working children			Total number of working Children (in millions)		
	Rural	Urban	Total	Rural	Urban	Total
<b>2001</b>	5.9	2.1	5.0	11.4	1.3	12.7
<b>2011</b>	4.3	2.9	3.9	8.1	2	10.1

Source: ILO

- How many children in the age group 6 to 14 are not attending school?
- How many children are not attending school and are also not working?
- What could be the possible reason for this?

28. Based on the information provided in tables 3 and 4, answer the following questions.

Table 3 *Fertility rates by country, 2006, in number*

Country	Number of Children	Country	Number of Children
Macao	0.9	Niger	7.9
HongKong	1.0	Mali	7.1
South Korea	1.1	Uganda	6.9
Taiwan	1.1	Afghanistan	6.8
Germany	1.3	Angola	6.8

Source: UN Data, World Population Prospects (2012).

- Define fertility rate.
- Which of the following is correct according to the data provided in the table 3?

- a. The numbers in table 3 indicate the number of children that women are capable of bearing.
- b. The fertility rate of Macao is 0.9, which means if continued at the same rate (assuming no immigration), population growth would move to zero.
- c. In Niger, the average woman gives birth to 7.9 children, five times as many as the average woman in Macao.
- d. The region of the world that has the highest fertility is Asia.

Table 4 *World crude birth rates and death rates (1950-2010), in per thousand*

<b>Years</b>	<b>Crude Birth Rate</b>	<b>Crude Death Rate</b>
<b>1970-1975</b>	30.8	11.4
<b>1975-1980</b>	28.4	10.7
<b>1980-1985</b>	27.9	10.3
<b>1985-1990</b>	27.3	9.7
<b>1990-1995</b>	24.7	9.4
<b>1995-2000</b>	22.5	8.9
<b>2000-2005</b>	21.2	8.6
<b>2000-2010</b>	20.3	8.5

*Source:* UN Data, World Population Prospects (2012).

- iii. What is natural increase in the population? In table 4, calculate the natural increase in population between 2005 and 2010.
29. A class of rental contracts that contains fixed rent and sharecropping contracts as special cases is defined as R. If Y denotes agricultural output on the rented land, F the fixed rent, then the total rent is  $R = \alpha Y + F$ . Assume both landlord and tenant as risk-neutral,
- i. If  $\alpha = 0$  and  $F < 0$ , who is likely to have more incentive to put effort? Landlord or tenant?
  - ii. Explain the double-incentive problem in putting efforts on the leased land.
  - iii. Given the double-incentive problem, sharecropping may be a compromise solution in which both the landlord and tenant put in some effort. True or False. Explain.
30. Answer the following questions.
- i. What is sustainable net national income?
  - ii. State two effects of climate change in developing countries as identified by the IPCC?

**Section D: Six Mark Question**

*Answer any one of the following*

31. The tables below show the extent of household income, in two villages A and B. On the basis of your understanding of the data provided, answer the following questions.

Table 5 *Descriptive statistics of total household income, study villages, in rupees*

<b>Description</b>	<b>A</b>	<b>B</b>
<b>Mean</b>	96,418	85,579
<b>Median</b>	50,026	42,120
<b>Minimum</b>	1,710	-16,818
<b>Maximum</b>	54,54,103	1,19,46,078
<b>Total number of households</b>	350	1205

Table 6 *Distribution of total household income, by income decile, study villages, in per cent*

<b>Income decile</b>	<b>Share in household number</b>	<b>Share in total household income in A</b>	<b>Share in total household income in B</b>
<b>Poorest</b>	10	2	1
<b>2</b>	10	3	2
<b>3</b>	10	4	3
<b>4</b>	10	5	4
<b>5</b>	10	6	4
<b>6</b>	10	6	7
<b>7</b>	10	7	7
<b>8</b>	10	10	9
<b>9</b>	10	12	12
<b>Richest</b>	10	46	51
<b>Total</b>	100	100	100

Table 7 *Distribution of households, by caste, by per capita income decile in village B*

<b>Income decile</b>	<b>Other Caste Hindu</b>	<b>Extreme Backward Caste</b>	<b>Backward Caste</b>	<b>Scheduled caste (SC)</b>
<b>Poorest</b>	7	4	9	18
<b>2</b>	4	8	17	15
<b>3</b>	3	11	15	12
<b>4</b>	5	13	10	12
<b>5</b>	6	14	5	10
<b>6</b>	10	13	0	11
<b>7</b>	8	9	17	11
<b>8</b>	12	13	17	4
<b>9</b>	13	15	4	5
<b>Richest</b>	31	2	5	2
<b>Total</b>	100	100	100	100



Each question carries 2 marks.

- i. Which village has higher income inequality? Substantiate.
- ii. How does the income distribution vary according to social groups in village B?
- iii. If you had to be a randomly selected person in a village, which village would you prefer to be born in?

***OR***

32. Consider a poverty measure  $P$  that satisfies symmetry, replication invariance, scale invariance, focus, monotonicity, and transfer. Please use the axioms to rank the following pair of distributions ( $x$  and  $y$ ) given the corresponding poverty lines ( $z$ ). Please state which axioms and what logic you use.

- i.  $x = (3, 1, 12, 6)$  with  $z = 8$  and  $y = (3, 9, 2, 6)$  with  $z = 8$
- ii.  $x = (2, 4, 10)$  with  $z = 15$  and  $y = (2, 10, 10, 4, 2, 4)$  with  $z = 15$
- iii.  $x = (3, 6, 12)$  with  $z = 10$  and  $y = (12, 4, 5)$  with  $z = 10$