MASTER OF ARTS EXAMINATION, 2025

(2nd Year, 1st Semester)

ECONOMICS

Economics of Social Sector

Time : *Two Hours* *Full Marks* : 30

(Answer question number **1** and *any* **two** from the rest)

1. Answer ***any four*** : 2·5×4=10

(a) How is income discounted in measuring Human Development Index (HDI) before 2010? 2.5

(b) Define the concept of 'low level trap', persistence (viz. stability), mobility (upward and downward) of human development over two time points across countries in the world. 2.5

(c) What does happen to the Foster, Greer and Thorbecke (FGT) Index of poverty if the sensitivity parameter (α) tends to infinity? 2.5

(d) Find the marginal contribution of life expectancy at birth in Human Development Index (after 2010 methodology). How would your result differ if you consider the earlier HDI methodology? 1.5+1

(e) Distinguish between Gini Index (GI) and Concentration Index (CI). Show that the Beta (β) coefficient represents the CI of the following regression equation :

$$k.h_i = \beta_0 + \beta_1.r_i + \varepsilon_i$$

Where, $k = \frac{2\sigma_r^2}{\mu}$, σ_r^2 = variance of fractional rank of socio-economic variable like income, μ is the mean of health variable (h), r is the fractional rank of socio-economic variable and ε stands for error term. 2.5

(f) Show that the Human Poverty Index (HPI) developed by Sen and Anand (1997) does suffer from the problem of aggregation (viz. overlapping and disjointness). Under what circumstance, the HPI does capture Head-Count Ratio (HCR)? 2+0·5

2. Explain Solow Residual (SR) in the context of analyzing the importance of human capital in economic growth. Consider the following implicit type production function :
$Y = Y(N, K, H)$, where Y = aggregate output, N = employment, K = physical capital and H = stock of human capital. How does the investment in education and healthcare affect Per Capita Income (PCI) in a transition economy like India? 4+6

3. Given the following data of income of 10 individuals residing in rural (R) and urban (U) areas. Prove that Gini Index is not perfectly sub-group decomposable but the mean log deviation (Theil (0)) is perfectly sub-group decomposable : 10

Rural (R) : 1, 3, 5, 5, 6, 7

Urban (U) : 5, 6, 8, 10

4. How do you establish the relationship between force of mortality (μ_x) and resistance to disease ($g(x)$)? Estimate the value of Disability Adjusted Life Years (DALYs) of a child who died at age 20 due to COVID, given that the constant of age-weighting function (A) = 0·16243, age-weighting parameter = 0·04, discount rate = 0·03, disability weight (D) = 1 and maximum Life Expectancy (LEB) = 87 years. 4+6

5. Formulate an econometric model on educational services with two variables-teacher and capital as input (with special reference to primary education), which follows constant returns to scale; assuming the rental rate on capital does not vary across countries. How can you estimate the effect of price variation from the data on teachers' wages? How can you decompose the school expenditures per school going child into a multiplicative function of four observable components viz. quantity, quality capital intensity and teacher salaries? 10

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