

Ambedkar University Delhi
School of Liberal Studies
Entrance Test 2018
PhD Economics

Maximum Marks: 50

Time: 2 hours 30 minutes

There are 3 sections each having 3 questions. Every question carries 10 marks.

Answer FIVE questions taking at least ONE from every section.

Please enter your Roll Number below before answering the questions.

Entrance Test Roll Number

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Providing your name or any other identifying information (other than the Entrance Test Roll Number) would lead to cancellation of the paper.

To be filled in by Examiners Only

A1	A2	A3	B1	B2	B3	C1	C2	C3	Total

SECTION A

- (1) Consider a consumer who consumes a single good in two periods, with a utility function of the form:

$$U(x_1, x_2) = \frac{1}{\gamma}(x_1^\gamma + \beta[x_2 + \theta x_1]^\gamma)$$

where x_1 and x_2 are the consumer's consumption *expenditure* in the two periods, β is a constant with $0 < \beta < 1$, γ is a constant with $0 < \gamma < 1$ and θ is a (positive or negative) constant such that $|\theta| < 1$. Assume that the endowments are ω_1 and ω_2 in the two periods.

The consumer can borrow and lend freely at a real interest rate r .

- Write down the consumer's budget constraint.
- Solve for the consumer's Euler equation and give an economic interpretation.
- Solve the consumer's optimization problem expressing x_1 and x_2 in terms of the endowments and the interest rate.
- Suppose an econometrician mistakenly believes that the consumer's utility function is

$$U(x_1, x_2) = \frac{1}{\gamma}(x_1^\gamma + \beta x_2^\gamma)$$

and uses the consumers' Euler equation and data on x_1 , x_2 and r to estimate γ . If $\theta > 0$ will the econometrician make an under- or an over-estimate of γ ? Clearly state the reasons for your answer.

- Define Total Factor Productivity (TFP). How do you measure TFP using actual data? Discuss one specific source of bias in TFP estimation.
- Let $f: \Re \rightarrow \Re$ and $g: \Re \rightarrow \Re$ be convex functions. Define $h(x) = \max[f(x), g(x)]$. Prove that $h(\cdot)$ is a convex function.
 - Prove* from first principles that adding one row of a given matrix to another does not change their rank of the matrix. You may not use any properties of matrices or determinants in your proof unless you prove those properties.

SECTION B

- Discuss any three methodological departures made by Marx in his Labour Theory of Value from that of 'Classical Political Economy'.
- 'As with many middle-income countries, India's fight against poverty needs now to focus less on the alleviation of extreme hardship. That battle is close to being won in large parts of the country. Instead, it needs to begin a new fight to build basic state capacity, providing decent government services and inexpensive forms of social security which can help its people build better lives. Here, the contrast with the successful emerging economies of East Asia is again clear. Most of these managed first to produce dramatic reductions in poverty, but then also developed a more inclusive model of growth shepherded by a more competent state machine, which, crucially, emphasized universal education and healthcare. That is now India's challenge too.'*

Do you agree with the author's view above? Discuss with reference to literature on different

approaches to growth and development.

- (3) 'Post the Global Financial Crisis, 2008, Neo-liberalism is less about the tussle between 'weak state vs strong state' and more about financialization of the economy.'

Comment on the above statement.

SECTION C

- (1) A researcher is trying to investigate the relationship between completed years of education and distance from students' home to the nearest college/university. The hypothesis is that proximity to college/university results on average higher number of completed years of education, keeping other things constant. To test the relationship, he has run a linear regression taking completed years of education as the dependent variable and distance as an explanatory variable along with several other control variables. The regression result is as follows:

VARIABLES	Model
Distance (measured in miles)	-0.0707*** (0.0151)
Average College Tuition Fee (in \$)	0.144 (0.110)
Country Unemployment rate (in %)	0.0130 (0.0111)
Hourly wage in manufacturing sector (in \$)	-0.0346 (0.0231)
Female (1=female/0=male)	0.0442 (0.0575)
Black (1=black/0=non black)	-0.381*** (0.0755)
Own home (1=family owns a home/0=family does not own a home)	-0.288*** (0.0760)
Urban (1=School in urban area/0=School not in urban area)	0.774*** (0.0651)
Family income (1=family income > \$25000 per year/0=income <=\$25000 per year)	-0.0127 (0.0717)
Constant	13.65*** (0.225)
Observations	3,796
R-squared	0.064

Standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

$$N = 3796 F(9, 3786) = 28.69, p - value = 0.000,$$

$$R^2 = 0.06, RSS = 11690, ESS = 797, TSS = 12487$$

Ramsey RESET test statistics: $F(3, 3783) = 4.67, Prob > F = 0.0029$

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity: $\chi^2(1) = 11.64, Prob > \chi^2 = 0.0006$

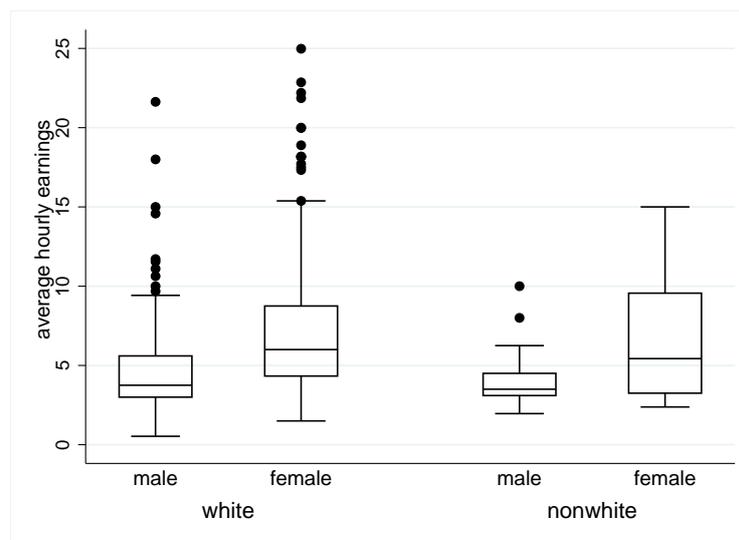
White's test for homoskedasticity: $\chi^2(49) = 111.10, Prob > \chi^2 = 0.0000$.

Shapiro-Wilk W test for normality of residuals:

Variable	Obs	W	V	z	Prob > z
residual	3796	0.92580	157.124	13.153	0.00000

Use the estimated regression result to answer the following questions:

- (a) Interpret the results of the regression and the diagnostics tests, given above. (2+2)
 - (b) Does this regression model suffer from the problem of omitted variable bias? If yes, explain why and discuss the consequences. (2+2)
 - (c) The researcher wants to control for difference in abilities of the student. Ability is not directly measurable but the researcher believes that it is correlated with at least one of the explanatory variables that have been included in the regression equation. What would be your suggestion to the researcher in such a situation? Explain (2)
- (2) The government is starting a new conditional cash transfer programme as a pilot in 200 districts. A mother will be given Rs. 5000 per month if her child, who is going to government school, has a monthly attendance of more than 80%. It wants to evaluate the impact of this initiative on school attendance and quality of learning. Propose a methodology that they must undertake. Discuss the strengths and limitations of such a methodology.
- (3) This question has two parts (a) and (b) of 5 marks each
- (a) The graph below provides information of weekly wage income (in dollars) according gender and race. Based on the following figure, comment on the relationship between wage, gender and race.



- (b) The figures below gives the distribution of the GDP per capita for 24 rich countries (Figure 1) and all countries in the world (Figure 2) from 1950 to 2010. Based on this discuss convergence of average incomes.

Figure 1: GDP per capita in 24-rich countries

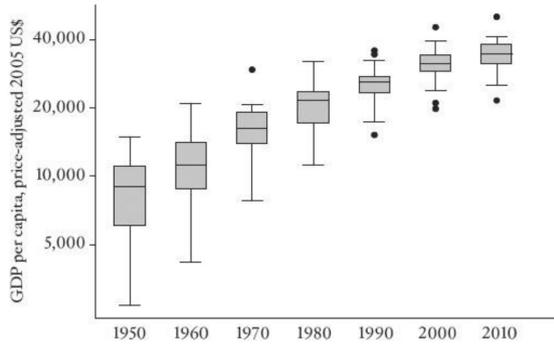


Figure 2: GDP per capita in all countries in the world

