Program: B. Sc. in Civil Engineering   Date: 28 May 2024
Semester: 8th Semester   Time: 10:00 am – 1:00 pm

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

Final Examination   Summer Semester: 2022 - 2023
Course Number: CEE 4807   Full Marks: 150
Course Title: Socioeconomic Aspects of Development Projects   Time: 3 Hours

There are 6 (Six) questions. **Answer all questions.** The symbols have their usual meanings. The examination is Offline and Closed Book. Marks of each question and the corresponding CO and PO are provided in brackets. The examination period is 3 hours.

1. (a)	Explain the direct and indirect impacts associated with a wastewater treatment plant. Draw an information flow diagram in the prediction and assessment of socio-economic impacts.	(10) (CO1) (PO1)
(b)	Describe the socioeconomic perspectives of any 5 (Five) mega national projects of Bangladesh and explain why these projects require involuntary resettlement.	(15) (CO1) (PO1)
2. (a)	What are the critical factors that influence beneficiary participation? Which levels of community participation can be expected in this regard?	(5) (CO1) (PO1)
(b)	A country's female-to-male wage ratio is 0.80; the share of the economically active female population is 0.45, and the share of the female population is 0.55. If the country's GNI per capita (of 2017 PPP $) is 10,000, estimate the country's male earned income per capita. Apply the methodological framework to develop MPI for that country. Include the dimensions, indicators, and weights to detail the framework.	(20) (CO2) (PO2)
3. (a)	Reclassify the land use of Bangladesh considering forest, fisheries, and aquaculture.	(5) (CO3) (PO6)
(b)	Assess and explain the following issues in terms of workforce development: • data collection, analysis, and reviews • skill-based training • relationship building • continuing education program • leverage industry expertise	(15) (CO3) (PO6)
(c)	State the significance of people's participation in the WSS projects.	(5) (CO1) (PO1)

4. (a) Estimate the female wage bill, female earned income per capita, male earned income per capita, female HDI, male HDI, and GDI from the following table. **(20) (CO2) (PO2)**

Indicator	Female Value	Male Value
Life expectancy at birth (years)	75	65
Expected years of schooling (years)	15	18
Mean years of schooling (years)	10	12
Wage ratio (female/male)		0.8
Gross national income per capita (2017 PPP $)		10,000
Share of the economically active population	0.40	0.60
Share of population	0.45	0.55

Goalposts for GDI are provided in the table below.

Indicator	Minimum	Maximum
Life expectancy at birth (years)		
Female	22	87
Male	17	82
Expected years of schooling (years)	0	18
Mean years of schooling (years)	0	15
Estimated earned income (2017 PPP $)	100	75,000

(b) Comment on the estimated GDI value in terms of the absolute deviation of GDI from gender parity. **(5) (CO2) (PO2)**

5. (a) Calculate the GII using the following parameters. Elaborate all the steps with proper explanation. **(15) (CO2) (PO2)**

	Health		Empowerment		Labour Market
	Maternal Mortality Ratio (deaths per 100,000 live births)	Adolescent Birth Rate (births per 1,000 women ages 15-19)	Share of Seats in Parliament (% held by women)	Population with at Least Some Secondary Education (%)	Labor Force Participation Rate (%)
Female	350	70	25	30	75
Male	NA	NA	75	40	75

(b) What are the major difficulties in conducting socio-economic assessment in developing countries? Which phases should be considered for any rural infrastructure development? **(10) (CO1) (PO1)**

6. (a) Assess the methodological frameworks of GDI, GII, and MPI. Explain the common grounds and differences of these five (5) indices.   **(15)**
(CO3)
(PO6)

(b) Exemplify the QOL index.   **(10)**
(CO3)
(PO6)

Notes

$$\frac{\Pi_j}{\Pi_a} \frac{W_{jm} \cdot EA_j}{W_{jm} \cdot EA_j + EA_{am}}$$

$$GNI p c = Y_i / T_i$$

$$GNI p c = S_{fi} / T_{ai}$$

$$N_i / N$$

$$1 - P_i$$

$$(I_{Income} \cdot I_{Education} \cdot I_{Health})^{1/3}$$

$$\sqrt[3]{\frac{H_i}{SDH} \cdot \frac{1}{AH}} \Big[-HW_i \cdot IC_P \cdot LDB_i\Big]$$

$$\left[\frac{(G_T)^2 + (G_P)^2}{2}\right]^{1/2}$$

$$\left\{\sqrt{\frac{HE}{SDH} \cdot \frac{1}{AH}} + 1\right\} \div 2$$

$$\sqrt{1 - (PR_{iq} \cdot SE_{iq})^{1/2} \cdot LSTS_{iq}}$$

$$\sqrt{(GABB \cdot Department tax) \cdot LTB}$$

$$\left\{\sqrt{PR_i \cdot SE_i} + \sqrt{PR_{iq} \cdot SE_{iq}}\right\} \div 2$$

$$\frac{LTPR_i + LTPR_{iq}}{2}$$

$$F = \frac{HARM \cdot (C_{i,1} \cdot C_{i,2})}{G_{i,j}}$$

$$A_{ij} = 1 - \frac{\sqrt[p]{X_i - X_{ij}}}{X_i}$$